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United States Department of the Interior
Bureau of Land Management

Montana State Office

August 2001



**FIRE MANAGEMENT PLAN/PLAN AMENDMENT
ENVIRONMENTAL ASSESSMENT
For
MONTANA AND THE DAKOTAS**

2002-006024/NF C

The Bureau of Land Management is responsible for the stewardship of our public lands. It is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people for all times. Management is based on the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation; rangelands; timber; minerals; watershed; fish and wildlife; wilderness; air; and scenic, scientific, and cultural values.

BLM/MT/PL-01/008

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IN REPLY TO:

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Montana State Office

5001 Southgate Drive, P.O. Box 36800

Billings, Montana 59107-6800

<http://www.mt.blm.gov/>



1600/9210 (923)

August 2001

Dear Reader:

The Bureau of Land Management (BLM) Montana/Dakotas Fire Management Plan NEPA Analysis is enclosed for your review and comment.

The 2000 fire season provided an unfortunate but ultimately valuable insight into the shortcomings of past fire management practices. In response to that increasing awareness, this document evaluates historical trends in managing and responding to fire on public lands, and analyzes the potential effects of new guidance under Alternative B (Proposed Management). The Proposed Management alternative constitutes a shift from previous management practices, especially concerning fuels management and immediate and unconditional wildland fire suppression. Greater emphasis would be placed on prescribed burning and other techniques to reduce hazardous fuels. If Alternative B is adopted, existing Resource Management Plans (RMPs) and one Management Framework Plan (MFP) may be amended as necessary.

Additional copies are available for review at each of the BLM Field Offices in Billings, Butte, Dillon, Glasgow, Great Falls, Havre, Lewistown, Malta, Miles City, Missoula, Dickinson, and Belle Fourche.

You may submit comments directly to the BLM state office for consideration by September 17, 2001. Please address your letters to:

John Thompson
Bureau of Land Management - Montana State Office
PO Box 36800
Billings, MT 59107-6800

After considering public input and making necessary revisions, BLM will issue a decision and approve all parts of the plans that are not being protested.

You may protest the proposed plan amendments if you believe that you or your interests will be negatively affected by the proposed management, and if: 1) you can document that you have participated in the planning process and 2) the issue(s) that you wish to protest were submitted for the record during the planning process. The protest period will also close on September 17, 2001.

Protest letters should include:

1. The name, mailing address, phone number, and interest of the person filing the protest;
2. A statement of the issue or issues being protested;
3. A statement of the part or parts of the plan amendment being protested;
4. A copy of all documents addressing the issue or issues that were submitted during the planning process by the protesting party or an

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- indication of the date the issue or issues were discussed for the record; and
5. A concise statement of why the proposed decision is believed to be incorrect. This is a critical part of your protest. Take care to document all relevant facts. As much as possible, reference or cite the planning documents, environmental analysis documents, available planning records (i.e. meeting minutes or summaries, correspondence, etc.). A protest which merely expresses disagreement with the proposed decision without providing any data will not provide us with the benefit of your information and insight. In this case, the Director's review would be based on existing analysis and existing supporting data.

Protest letters should be addressed to:

Department of the Interior, Bureau of Land Management
Mail Stop 1075LS, 1849 C Street NW
Attention: Ms. Brenda Williams, Protest Coordinator
Washington, D.C. 20240

Thank you for your continuing interest and participation in the planning process. If you have any questions, please direct them to John Thompson at the Montana State Office at (406)896-5030.

Sincerely,

Roberta A. Moltzen
Roberta A. Moltzen

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**United States Department of the Interior
Bureau of Land Management**

**FIRE MANAGEMENT PLAN/PLAN AMENDMENT
ENVIRONMENTAL ASSESSMENT**

FOR

MONTANA AND THE DAKOTAS

**Montana State Office
Billings, Montana**

August 2001

CONTENTS

PURPOSE AND NEED FOR ACTION	1
Background	1
Scope of Analysis	1
Decisions to be Made	1
Document Organization	1
ALTERNATIVES	2
Alternative A	2
Alternative B	2
Anticipated Levels of Activity	9
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	9
Critical Elements	9
Vegetation	19
Grasslands	24
Shrublands	25
Forest Lands	26
Range Management	29
Air	30
Soils	31
Water Quality and Quantity	34
Fish and Wildlife	35
Cultural Resources	46
Recreational and Visual	47
Wilderness and Special Areas	47
Human Health and Safety	47
Sociology	47
Relationship Between Short-term Uses and Long-term Productivity	48
CONSULTATION, COORDINATION AND PUBLIC PARTICIPATION	48
Public Notices, External and Internal Scoping	48
Chronology	48
Scoping Comments	50
APPENDICES	
Appendix A - Resource Considerations	51
Appendix B - Billings Field Office Proposed Fire Management Plan	63
Appendix C - Butte Field Office Proposed Fire Management Plan	71
Appendix D - Dillon Field Office Proposed Fire Management Plan	81
Appendix E - Lewistown Field Office Proposed Fire Management Plan	91
Appendix F - Malta Field Office Proposed Fire Management Plan	101
Appendix G - Miles City Field Office Proposed Fire Management Plan	107
Appendix H - Missoula Field Office Proposed Fire Management Plan	117
Appendix I - North Dakota Field Office Proposed Fire Management Plan	129
Appendix J - South Dakota Field Office Proposed Fire Management Plan	131
Appendix K - References	135

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PURPOSE AND NEED FOR ACTION

The federal action considered in this environmental assessment (EA) is to implement fire management guidelines for Montana/Dakotas Bureau of Land Management (BLM) which follow the Federal Wildland Fire Management Policy (December 1995 and the January 2001 Amendment and Update). These guidelines place new emphasis on managing fuels to reduce the risk of wildfire to urban interface areas and to reduce natural resource damage from wildland fires. These guidelines also change some tactics which BLM uses to suppress certain wildfires.

A change in fire management strategies and tactics is needed to 1) reduce the risk and cost of severe wildland fires; 2) sustain the ecological health and function of grasslands, shrublands and forest ecosystems that are fire adapted; 3) minimize the adverse impacts of wildland fire suppression; and 4) use fire to reduce hazardous fuels while meeting other resource management objectives.

Background

During the 2000 fire season, the Northern Rockies experienced 4,065 wildland fires that burned 1,083,863 acres. More than 12,900 BLM acres were burned, 250 structures were destroyed (including 80 primary residences), and suppression costs were approximately \$500 million. In recent years, wildland fires in forests and on ranges have burned hotter, bigger, and faster, growing ever more lethal, destructive, and expensive to fight. Between 1987 and 1998, the BLM responded to more than 1,500 fires that burned over 265,000 acres in Montana and the Dakotas.

Scope of analysis

Nearly all of the 8 million acres of public land administered by the BLM in Montana and the Dakotas were historically burned by wildfire and most are still at risk of disturbance by periodic wildfire. This EA addresses fire management guidelines and fuel reduction treatments that are appropriate given other resource management objectives. Guidance for wildland fire suppression and prescribed burning are identified and analyzed. Other vegetation treatments and their environmental impacts are not addressed in this analysis but they are analyzed in BLM Resource Management Plans (RMPs) for Montana and the Dakotas and in the 1991 BLM Vegetation Treatment EIS and the various RMPs that guide resource management on BLM administered lands.

The effects of prescribed fire and other fuel reduction projects on public lands will be addressed in site-specific EAs for specific projects. Because wildland fire suppression actions are considered emergency actions under Comprehensive Environmental Response, Compensation, Liability and Recovery Act (CERCLA), only limited environmental review will be made of suppression activities in this analysis.

Management responsibility and general location and setting: The BLM has fire management responsibility on more than eight million acres of public land in Montana and the Dakotas. To more efficiently and effectively manage equipment and personnel, the BLM has agreed to provide wildland fire suppression to more than 600,000 acres of other federal and state agency lands in eastern Montana while other federal and state agencies have agreed to provide primary fire suppression to 1.7 million acres of public land for the BLM in western Montana. Each agency, however, is responsible for providing guidance and direction for wildland fire suppression and rehabilitation as well as the use of prescribed fire and other fuels management on the lands for which they have administrative responsibility.

The area covered by this environmental analysis covers two major geographic regions - the Northern Great Plains and the Northern Rocky Mountains in Montana. Most of the area is drained by the Missouri River and its tributaries. Public lands in the Missoula Field Office (formerly the Garnet Resource Area) and a small portion of the Headwaters Resource Area are on the west side of the continental divide and are part of the Upper Columbia River Basin.

Decisions to be Made

The BLM's Montana State Director will issue a Decision Record (DR) to implement the proposed guidance, to take no action or to select another alternative. If the proposed guidance is selected, some of the resource management plans or one management framework plan (RMPs or MFP) for public lands in Montana/Dakotas that do not comply with the DR will also be amended.

Document Organization

This EA consists of five sections:

Purpose and Need: describes the purpose of and need for the proposed federal action, management responsibility, location, and setting.

Alternatives: describes the alternatives considered in detail and provides a summary comparison of alternatives.

Affected Environment and Environmental Consequences: describes the environment and other resources that would be affected, and analyzes the impacts.

Consultation, Coordination, and Public Participation: describes the scoping process and coordination with the public, agencies, tribal governments, and private organizations that occurred during the preparation of this analysis. A chronology of consultation and coordination is also included.

References and Appendices: A list of references and separate appendices to support the analysis are also included. The appendices include a summary of the fire management for each Field Office.

ALTERNATIVES

This EA compares the potential environmental consequences of past fire management policies and strategies with those that reflect the direction of the Federal Wildland Fire Management Policy (1995) and the 2001 Amendment. Knowledge and understanding has grown since the days when all fires were automatically suppressed. Federal agencies now recognize that fire is a critical natural process that helps maintain healthy ecosystems and guards against natural disasters. The alternatives considered in detail represent two different options for fire management on BLM-administered public lands.

We analyze how fire can be used to help achieve resource objectives identified in land use plans and to reduce dangerous accumulations of fuel. Fire suppression, prescribed burning, and other fuels management options have been studied as methods for using fire management to sustain healthy ecosystems while reducing the risk and cost of fire suppression.

Alternative A (Continuation of Past Management)

This alternative is referred to as the "No Action" alternative because there would be no change from past management. Management direction in current RMPs and one remaining Management Framework Plan (MFP) provides inconsistent guidance to fire managers. For example, some plans require full and aggressive initial attack on all wildland fires, while others are silent on the topic. Some RMPs also appear to have inappropriate limits on the use of prescribed burning and other hazardous fuels reduction treatments. The issue and opportunities for hazardous fuels reductions, especially near interface areas, were not addressed in most of these planning documents.

Under this alternative, land use and resource management objectives receive less consideration when 1) identifying fire management objectives, 2) developing strategies for wildland fire suppression and rehabilitation, or 3) developing prescribed burn and other fuel management guidance. No amendments would be made to RMPs or the MFP.

Fire Management Objectives:

Fire would seldom be used to achieve responsible and definable land use benefits through the integration of fire suppression and prescribed fire as a management tool. Seldom have fire management objectives been integrated with other resource objectives in the land use plans. Too often, past management plans and strategies have not considered fire history, land status, issues, concerns, and other resource objectives. Fire was not desired.

Wildland Fire Suppression and Rehabilitation:

Wildland fires would generally be held to the minimum possible size through timely and effective suppression action consistent with values at risk and within framework of land use objectives and plans. Usually, aggressive initial attack would be taken on all fires that occur on or threaten BLM lands. Wildland fires would very seldom be used to accomplish land use and resource management objectives. Other resource management concerns and objectives would often not be considered during wildland fire suppression and rehabilitation.

Prescribed Fire and Other Fuels Management:

Prescribed fire may be used to accomplish land use or resource management objectives only when defined in prescribed fire plans. Wildland fires would not be allowed to burn even if it is "in prescription". Some of the current planning documents limit the use of prescribed fire to very small areas across the entire planning area.

Alternative B (Implementation of the Federal Wildland Fire Management Policy, update of Montana Fire Management Plan, and appropriate RMP amendments)

Alternative B represents the proposed fire management plan and strategies for Montana and the Dakotas. This reflects implementation of the Federal Wildland Fire Management Policy. With this alternative, fire management objectives would be developed following careful

consideration of other resource management objectives. Strategies for wildland fire suppression and rehabilitation as well as prescribed burning and other fuels management strategies will be based on these objectives. RMPs and the MFP would be updated as necessary to be consistent with the fire management objectives and guidance contained in the proposed fire management plan.

Other resource objectives, concerns, and issues to be considered during fire management planning and implementation are described in Appendix A (Resource Considerations). Generally, these would be adopted as standard operating procedures and guidance for wildland fire suppression and rehabilitation or for prescribed burning and other fuels management activities.

The proposed management plan and strategy was based on consideration of fire history, land status, issues, concerns, and other resource objectives. These were used to develop initial fire management objectives and strategies for BLM administered public lands. Four fire management categories were identified. These are described below and include an estimate of the number of BLM administered surface acres that would occur in each category:

Category A: (44,000 acres) Lands where wildland fires and prescribed fire are not desired due to reasons other than ecological. Reasons may be political, social, economic, or tied to current land uses. In these areas emphasis would be placed on prevention, detection, rapid response, use of appropriate suppression techniques and tools, and non-fire fuels treatments. Aggressive fire suppression may be required to prevent unacceptable resource damage or to prevent loss of life and property.

Category B: (5.78 million acres) Where unplanned wildland fire is expected to cause negative effects, but these may be mitigated or avoided through fuels management, prescribed fire, prevention of human caused fires, or other strategies.

Category C: (2.46 million acres) Where fire is desired to help manage the ecosystem, but there are constraints because of the existing vegetation condition due to fire exclusion. In these areas more substantial non-fire fuels treatments may be necessary prior to use of prescribed fire.

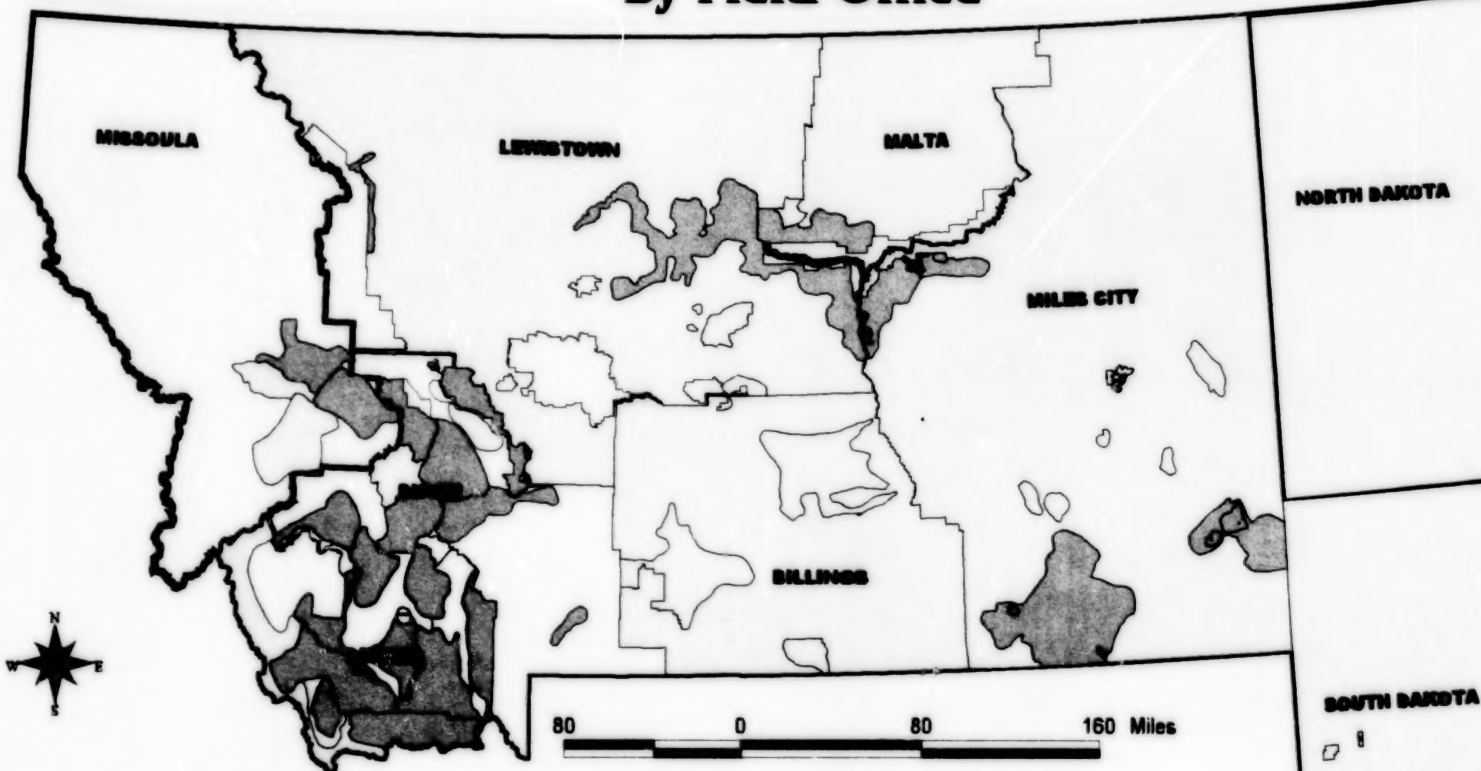
Category D: (27,000 acres) Where fire may be desired and there are no constraints associated with resource condition, or social, economic, or political considerations. In these areas natural and management-ignited fire may be used to achieve desired objectives, such as to improve vegetation or watershed condition.

Map 1 shows fire management zones and fire management categories for each zone/polygon, and Field Office boundaries in Montana and the Dakotas. These fire management zones or polygons are shown for each Field Office, and are meant to represent current conditions. As demographic, social and economic conditions and fire occurrence change, boundaries of fire management zones may shift accordingly without a plan amendment. Table 1 lists the fire management zones and categories by Field Office. Table 2 provides a summary comparison of alternatives.

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MAP 1 MONTANA-DAKOTA FIRE MANAGEMENT ZONES by Field Office



LEGEND



Category A: Wildland fire is not desired.
44,000 acres of public land administered by BLM



Category C: Fire is a desired ecosystem
management tool, but constraints exist due to
volatile vegetation conditions through fire
exclusion.
2.46 million acres of public land administered by BLM



Category B: Wildland fire is unplanned and likely
to cause negative effects, but these effects may
be mitigated or avoided through fuels management,
prescribed fire, or other strategies.
5.78 million acres of public land administered by BLM



Category D: Fire is desired, and there are no
constraints associated with resource condition,
or social, economic, or political considerations.
27,000 acres of public land administered by BLM

TABLE 1 MONTANA/DAKOTAS FIRE MANAGEMENT ZONES

Field Office	Fire Management Zone	Category	Size (acres)	% BLM
Billings	1. Billings Grasslands	B	262,000	2
	2. Roundup	B	88,000	2
	3. Pryor Mountains	B	43,000	37
	4. Big Timber/Absaroka	B	17,200	3
	5. Twin Coulee WSA	B	7,000	55
	6. Pompeys Pillar National Monument & ACEC	B	500	100
Butte	1. Absaroka Foothills	C	67,700	6
	2. Big Belt Mountains	C	328,200	1
	3. Big Hole River Corridor	C	68,800	26
	4. Blackfoot (See Missoula FO)	C	340,800	19
	5. Boulder River	B	264,400	5
	6. Clancy/Marysville	C	269,100	19
	7. Elkhorn Mountains	C	471,600	14
	8. Fleecer Mountains	C	284,300	6
	9. Hoodoo (See Missoula FO)	C	389,400	3
	10. McCartney/Rochester	C	273,600	43
	11. North Hills	B	32,300	20
	12. Pipestone	C	369,300	11
	13. Scratchgravel Hills	B	58,600	12
	14. Sleeping Giant/Sheep Creek	C	11,600	95
	15. Spokane Hills and North	B	151,200	4
	16. Three Forks	C	356,100	8
	17. Wise River Townsite	B	10,100	14
	18. Bozeman/Livingston Scattered Tracts	A	526,400	<1
Dillon	1. Beaverhead Mountains	B	743,300	4
	2. Beaverhead/Jefferson	A	937,500	4
	3. Big Hole River Corridor	C	68,800	26
	4. Big Sheep/Medicine Lodge Backcountry Byway	B	96,100	48
	5. Blacktail Mountains	C	34,600	62
	6. Blacktail/Horse Prairie	C	593,300	39
	7. Centennial	C	505,800	27
	8. East Madison	C	359,600	2
	9. Gravelly Mountains	C	556,600	6
	10. Madison Valley	A	352,000	5
	11. McCartney/Rochester	C	273,600	43
	12. North Rubys	D	26,800	92
	13. SE Foothills/Pioneers	C	199,100	45
	14. Sweetwater/Ruby	C	295,300	28
	15. Tendoy Mountains	C	131,700	33
	16. Tobacco Root Mountains	C	289,900	10
	17. Wise River Townsite	B	10,100	14
Lewistown	1. Judith	B	172,300	13
	2. Little Snowy Mountains	B	75,000	12
	3. Missouri Breaks	C	1,463,700	46
	4. North and South Moccasins	B	14,900	31
	5. Prairie Grass/Brush & Agricultural Lands	B	19,401,800	3
	6. Rocky Mountain Front	C	82,800	17

TABLE 1 MONTANA/DAKOTAS FIRE MANAGEMENT ZONES (CONTINUED)

Field Office	Fire Management Zone	Category	Size (acres)	% BLM
Malta	1. Grass & Range Lands	B	4,913,700	37
	2. Little Rocky Mountains, Timber	B	65,200	46
	3. Missouri Breaks Uplands	C	376,300	66
Miles City	1. Cedar Breaks	B	122,000	49
	2. Custer National Forest	C	1,804,500	8
	3. Knowlton-Locate	B	36,200	35
	4. Missouri-Musselshell River Breaks	C	483,000	34
	5. Mixed Grass Prairie Sagebrush	B	23,020,300	9
	6. Rural Interface	B	232,700	13
	7. Special Management Areas	C	95,000	98
Missoula	1. Blackfoot	C	340,800	19
	2. Clark Fork Front	B	205,700	7
	3. Flintrock	B	521,500	4
	4. Hoodoo	C	389,400	8
North Dakota	1. North Dakota Resource Area	B	59,100*	
South Dakota	2. Exemption Area	B	22,400	24
	3. Fort Meade Recreation Area ACEC	B	6,700	97
	4. Remainder of SD Field Office	B	268,900**	

*There are 59,100 acres of BLM land across North Dakota.

**There are 268,900 acres of BLM land in the remainder of the South Dakota Field Office.

TABLE 2 SUMMARY COMPARISON OF ALTERNATIVES

ALTERNATIVE A: PAST MANAGEMENT	ALTERNATIVE B: PROPOSED MANAGEMENT
RESOURCE MANAGEMENT PLANS (RMPs): RMPs would not be amended at this time concerning fire management.	RESOURCE MANAGEMENT PLANS (RMPs): RMPs would be amended where appropriate to be consistent with the Federal Wildland Fire Management Policy and proposed fire management plan. SEE INDIVIDUAL FIELD OFFICE FIRE MANAGEMENT PLANS FOR SPECIFIC GUIDANCE.
WILDLAND FIRE SUPPRESSION: Aggressive initial attack would be taken on all fires that occur on or threaten BLM lands. Wildland fire generally would not be used to accomplish land use and resource management objectives.	WILDLAND FIRE SUPPRESSION: The following areas and values would be protected from wildland fire on BLM-administered lands: buildings and structures; oil and gas fields and related facilities; coal mines and related facilities; rock art, cultural sites, and historic structures; power lines; communities; important wildlife habitat; campgrounds and other developed recreation areas; forested areas where potential loss of key ecosystem components is high; lands having intermingled public, state, and private ownership where there are currently no agreements for using wildfire as a resource management tool; and other areas identified through continued public involvement in fire planning efforts. To reduce wildland fire suppression costs and to minimize risk to firefighters in B, C, and D areas, fires may be allowed to burn up to natural fuel breaks where and when it is reasonable and beneficial to resource values. Category A and B areas: Appropriate suppression would involve rapid response, use of appropriate suppression techniques and tools. Full suppression may be required to prevent unacceptable resource damage or to prevent loss of life and property. Category C areas: Since fire may be desired to help manage the ecosystem, suppression may be less aggressive. Minimal impact suppression ("Light-on-the-land") methods would be applied where it is anticipated that the use of heavy equipment to suppress wildland fires would cause more adverse impacts than the fire itself. Examples may be Wilderness Study Areas, designated Areas of Critical Environmental Concern, and designated areas of important cultural values. Category D areas: Appropriate management response to natural ignitions may be to monitor the fire and allow it to burn to achieve desired resource objectives. SEE INDIVIDUAL FIELD OFFICE FIRE MANAGEMENT PLANS FOR SPECIFIC GUIDANCE.

Anticipated Levels of Activity

Part of Alternative B would involve identifying projects (mechanical and prescribed fire) with the objective to reduce hazardous fuels near interface areas as well as other projects with the objective to reduce hazardous fuels.

Comparing the anticipated levels of activities for the two alternatives provides a basis for impact analysis and better shows the anticipated differences between the two alternatives. Table 3 displays the comparison of anticipated levels of activities between the two alternatives.

TABLE 3 COMPARISON OF ANTICIPATED AVERAGE ANNUAL LEVEL OF ACTIVITY		
ACTION/TREATMENT	ALTERNATIVE A	ALTERNATIVE B
Wildland fires (average number and BLM acres burned)	77 fires; 9,068 acres. Number, damage, and cost of suppression would increase.	Similar to A in the short term; acres burned and intensity of fires would gradually decrease as hazardous fuel loads are reduced. Damage and cost of suppression should decrease in areas treated.
Acres of rehabilitation	unknown, but related to the number of acres burned by wildfire	Same as A in the short term; eventually the number of acres treated should be less than with Alternative A since wildfire on treated areas should require less rehabilitation.
Prescribed fires (annual average number and acres treated)	10 fires; 2200 acres. Some RMPs limit the acres treated with prescribed fires.	The number and total acres treated would increase. Acreage limitations on the use of prescribed fire would be removed.
Projects with the objective to reduce fuels near interface areas	0	The number of projects and acres treated would increase dramatically. 91 priority interface areas with hazardous fuels were identified in FY 2001.
Projects with an objective to reduce hazardous fuels	0	The number of projects and acres treated would increase dramatically.
Projects to meet other resource objective.	0	The number of projects and acres treated would increase.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

This section describes the resources and values that could be affected by fire management decisions on public lands. Also summarized in this section are the environmental consequences that are anticipated to occur as a result of fire (both wildland and prescribed fire). A summary description of the land and vegetation types and fire effects on these vegetation types is compiled from detailed information about fire effects on specific vegetation types. The environmental effects of prescribed burning and other vegetation treatments on other resources and values are summarized from the 1991 Final Environmental Impact

Statement on Vegetation Treatment on BLM Lands (USDI, BLM).

Critical Elements of the Human Environment

The following elements of the human environment are subject to requirements specified in statute, regulations, or executive order. Past management plans (Alternative A) have not always considered critical elements when developing fire management objectives or guidance relative to wildland fire suppression or rehabilitation or for prescribed burning.

Anticipated Levels of Activity

Part of Alternative B would involve identifying projects (mechanical and prescribed fire) with the objective to reduce hazardous fuels near interface areas as well as other projects with the objective to reduce hazardous fuels.

Comparing the anticipated levels of activities for the two alternatives provides a basis for impact analysis and better shows the anticipated differences between the two alternatives. Table 3 displays the comparison of anticipated levels of activities between the two alternatives.

TABLE 3 COMPARISON OF ANTICIPATED AVERAGE ANNUAL LEVEL OF ACTIVITY		
ACTION/TREATMENT	ALTERNATIVE A	ALTERNATIVE B
Wildland fires (average number and BLM acres burned)	77 fires; 9,068 acres. Number, damage, and cost of suppression would increase.	Similar to A in the short term; acres burned and intensity of fires would gradually decrease as hazardous fuel loads are reduced. Damage and cost of suppression should decrease in areas treated.
Acres of rehabilitation	unknown, but related to the number of acres burned by wildfire	Same as A in the short term; eventually the number of acres treated should be less than with Alternative A since wildfire on treated areas should require less rehabilitation.
Prescribed fires (annual average number and acres treated)	10 fires; 2200 acres. Some RMPs limit the acres treated with prescribed fires.	The number and total acres treated would increase. Acreage limitations on the use of prescribed fire would be removed.
Projects with the objective to reduce fuels near interface areas	0	The number of projects and acres treated would increase dramatically. 91 priority interface areas with hazardous fuels were identified in FY 2001.
Projects with an objective to reduce hazardous fuels	0	The number of projects and acres treated would increase dramatically.
Projects to meet other resource objective.	0	The number of projects and acres treated would increase.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

This section describes the resources and values that could be affected by fire management decisions on public lands. Also summarized in this section are the environmental consequences that are anticipated to occur as a result of fire (both wildland and prescribed fire). A summary description of the land and vegetation types and fire effects on these vegetation types is compiled from detailed information about fire effects on specific vegetation types. The environmental effects of prescribed burning and other vegetation treatments on other resources and values are summarized from the 1991 Final Environmental Impact

Statement on Vegetation Treatment on BLM Lands (USDI, BLM).

Critical Elements of the Human Environment

The following elements of the human environment are subject to requirements specified in statute, regulations, or executive order. Past management plans (Alternative A) have not always considered critical elements when developing fire management objectives or guidance relative to wildland fire suppression or rehabilitation or for prescribed burning.

The proposed fire management plan (Alternative B) does consider the following critical elements in developing fire management objectives and guidance for wildland fire suppression and rehabilitation as well as guidance for prescribed fire and other hazardous fuels reduction efforts.

Air Quality: Any decisions or actions related to prescribed burning and other fuel reductions projects must comply with air quality legislation, including the Clean Air Act. The impacts are described in the air quality section. Further resource considerations (Appendix A) contain guidance related to air quality.

Areas of Critical Environmental Concern (ACEC): The BLM has designated over 40 areas within Montana and the Dakotas as ACECs. These areas have received special

designations and ACEC management plans have been adopted to protect various unique resources and values. Many of the ACEC management plans under Alternative A did not address fire management. The proposed fire management plan (Alternative B) does provide resource considerations which are used in developing for each ACEC, fire management objectives and guidance for wildland fire suppression and rehabilitation as well as guidance for prescribed fire and other hazardous fuels reduction efforts. This information is contained in the Fire Management Plan for each Field Office (Appendices B-J). The proposed special fire management guidance for ACECs is summarized in Table 4. Impacts to the ACEC resources and values are described below by resource or value.

TABLE 4 ACEC MANAGEMENT GUIDANCE

Field Office	ACEC Name	Size (Acres)	Reason for Designation	Proposed Special Fire Management Guidance
Billings	Four Dances (proposed)	765	Archeological, cultural, scenery, natural hazards, historic	See Appendix B, Common guidance for fire suppression and prescribed fires, and guidance specific to Billings Grasslands.
Billings	East Pryor Mountains	29,500	Wildlife, Wild Horses, Paleontology	See Appendix B, Common guidance for fire suppression and prescribed fires, and guidance specific to Pryor Mountains.
Billings	Weatherman Draw	4,268	Cultural	See Appendix B, Common guidance for fire suppression and prescribed fires, and guidance specific to Billings Grasslands.
Billings	Meeteetse Spires	960	Rare Plant, Hazardous Cliffs, Scenery	See Appendix B, Common guidance for fire suppression and prescribed fires, and guidance specific to Billings Grasslands.
Billings	Bridger Fossil	575	Paleontology	See Appendix B, Common guidance for fire suppression and prescribed fires, and guidance specific to Billings Grasslands.
Billings	Stark Site	800	Cultural	See Appendix B, Common guidance for fire suppression and prescribed fires, and guidance specific to Billings Grasslands.
Billings	Petroglyph Canyon	240	Cultural	See Appendix B, Common guidance for fire suppression and prescribed fires, and guidance specific to Billings Grasslands.
Billings	Pompeys Pillar	470	Historic, Cultural, Recreation	See Appendix B, Common guidance for fire suppression and prescribed fires, and guidance specific to Pompeys Pillar.
Billings	Castle Butte	185	Cultural	See Appendix B, Common guidance for fire suppression and prescribed fires, and guidance specific to Billings Grasslands.

TABLE 4 ACEC MANAGEMENT GUIDANCE (continued)

Field Office	ACEC Name	Size (Acres)	Reason for Designation	Proposed Special Fire Management Guidance
Butte	Sleeping Giant	11,609	Recreation, Scenic, Fish & Wildlife	See Appendix C, Common guidance for fire suppression and prescribed fires, and guidance specific to Sleeping Giant/Sheep Creek.
Lewistown	Sweetgrass Hills	7,952	Cultural, T&E, Wildlife, Recreation	See Appendix E, Common guidance for fire suppression and prescribed fires, and guidance specific to Prairie Grass, Brush, and Agricultural Lands.
Lewistown	Kevin Rim	4,657	Fish & Wildlife, Cultural Resources, Recreation	See Appendix E, Common guidance for fire suppression and prescribed fires, and guidance specific to Prairie Grass, Brush, and Agricultural Lands.
Lewistown	Acid Shale-Pine Forest	2,463	Endemic Plant Community	See Appendix E, Common guidance for fire suppression and prescribed fires, and guidance specific to Prairie Grass, Brush, and Agricultural Lands.
Lewistown	Judith Mountains Scenic Area	3,702	Scenic, Wildlife, Recreation	See Appendix E, Common guidance for fire suppression and prescribed fires, and guidance specific to Judith Mountains.
Lewistown	Collar Gulch	1,618	Westslope Cutthroat Trout	See Appendix E, Common guidance for fire suppression and prescribed fires, and guidance specific to Judith, North and South Moccasin, Little Snowy Mountains.
Lewistown	Square Butte ONA	1,947	Natural Endemic Systems, Cultural, Scenic, Geologic	See Appendix E, Common guidance for fire suppression and prescribed fires, and guidance specific to Prairie Grass/Brush and Agricultural Lands.
Lewistown	Cow Creek	14,000	Riparian, Natural Hazard, Geological, Scenic, Natural System	See Appendix E, Common guidance for fire suppression and prescribed fires, and guidance specific to Missouri Breaks.
Malta	Prairie Dog Towns	12,346	Habitat For Black-Footed Ferret Reintroduction	See Appendix F, Common guidance for fire suppression and prescribed fires, and guidance specific to Grass and Range Lands.
Malta	Big Bend of the Milk River	2,120	Archaeological Resources	See Appendix F, Common guidance for fire suppression and prescribed fires, and guidance specific to Grass and Range Lands.
Malta	Azure Cave	140	Cave Resources, Bats	See Appendix F, Common guidance for fire suppression and prescribed fires, and guidance specific to Little Rocky Mountains, Timber.
Miles City	Powder River Depot	1,386	Cultural	See Appendix G, Common guidance for fire suppression and prescribed fires, and guidance specific to Special Management Areas.

TABLE 4 ACEC MANAGEMENT GUIDANCE (continued)

Field Office	ACEC Name	Size (Acres)	Reason for Designation	Proposed Special Fire Management Guidance
Miles City	Hell Creek	19,169	Paleo	See Appendix G, Common guidance for fire suppression and prescribed fires, and guidance specific to Special Management Areas.
Miles City	Sand Arroyo	9,056	Paleo	See Appendix G, Common guidance for fire suppression and prescribed fires, and guidance specific to Special Management Areas.
Miles City	Smoky Butte	80	Geology, Recreation	See Appendix G, Common guidance for fire suppression and prescribed fires, and guidance specific to Special Management Areas.
Miles City	Black-footed Ferret	11,166	Wildlife	See Appendix G, Common guidance for fire suppression and prescribed fires, and guidance specific to Special Management Areas.
Miles City	Piping Plover	16	Wildlife	See Appendix G, Common guidance for fire suppression and prescribed fires, and guidance specific to Special Management Areas.
Miles City	Jordan Bison Kill	160	Cultural	See Appendix G, Common guidance for fire suppression and prescribed fires, and guidance specific to Special Management Areas.
Miles City	Seline	80	Cultural	See Appendix G, Common guidance for fire suppression and prescribed fires, and guidance specific to Special Management Areas.
Miles City	Ash Creek Divide	7,931	Paleo	See Appendix G, Common guidance for fire suppression and prescribed fires, and guidance specific to Special Management Areas.
Miles City	Hoe	144	Cultural	See Appendix G, Common guidance for fire suppression and prescribed fires, and guidance specific to Special Management Areas.
Miles City	Big Sheep Mountain	360	Cultural	See Appendix G, Common guidance for fire suppression and prescribed fires, and guidance specific to Special Management Areas.
Miles City	Bug Creek	3,840	Paleo	See Appendix G, Common guidance for fire suppression and prescribed fires, and guidance specific to Special Management Areas.

TABLE 4 ACEC MANAGEMENT GUIDANCE (continued)

Field Office	ACEC Name	Size (Acres)	Reason for Designation	Proposed Special Fire Management Guidance
Miles City	Finger Buttes	1,520	Scenery	See Appendix G, Common guidance for fire suppression and prescribed fires, and guidance specific to Special Management Areas.
Miles City	Howrey Island	321	T&E Wildlife	See Appendix G, Common guidance for fire suppression and prescribed fires, and guidance specific to Special Management Areas.
Miles City	Battle Butte	120	Cultural	See Appendix G, Common guidance for fire suppression and prescribed fires, and guidance specific to Special Management Areas.
Miles City	Reynolds Battlefield	336	Cultural	See Appendix G, Common guidance for fire suppression and prescribed fires, and guidance specific to Special Management Areas.
Miles City	Ash Creek Divide	7,931	Paleontology	See Appendix G, Common guidance for fire suppression and prescribed fires, and guidance specific to Special Management Areas.
Missoula	Bear Creek Flats	564	Riparian, Fish, T&E Species, Wildlife, Old Growth Pine, Recreation	See Appendix H, Common guidance for fire suppression and prescribed fires, and guidance specific to Blackfoot.
Missoula	Rattler Gulch Limestone Cliffs	20	Geological	See Appendix H, Common guidance for fire suppression and prescribed fires, and guidance specific to Clark Fork Front.
Missoula	Squaw Rock	640	Fish, Wildlife, Recreation, Scenic	See Appendix H, Common guidance for fire suppression and prescribed fires, and guidance specific to Flintrock.
South Dakota	Fort Meade Recreation Area	6,700	Historic, Cultural	See Appendix J, Common guidance for fire suppression and prescribed fires, and guidance specific to Fort Meade Recreation Area ACEC.
South Dakota	Fossil Cycad	321	Paleontology	See Appendix J, Common guidance for fire suppression and prescribed fires, and guidance specific to Remainder of the South Dakota Field Office.

Cultural Resources: Archaeological resources which are considered eligible for the National Register of Historic Places (NRHP) should either be avoided or, in consultation with the State Historic Preservation Officer (SHPO), a plan for mitigating the effects of the proposed actions should be formulated and implemented. Past management (Alternative A) has been inconsistent in the application of guidance for cultural resource protection from wildland fire. The proposed fire management plan (Alternative B) does provide fire management objectives and guidance for wildland fire suppression and rehabilitation as well as guidance for prescribed fire and other hazardous fuels reduction efforts to protect cultural resources.

Environmental Justice: Neither alternative would have disproportionately high or adverse effects on human health or environmental effects on low-income or minority populations, as provided for under Environmental Justice considerations.

Farm Lands (Prime or Unique): The Farmland Protection Policy Act of 1985 and 1995 requires identification of proposed actions that would affect any lands classified as prime and unique farmlands. The purpose of the Act is to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses. Neither the wildland fire suppression and rehabilitation nor the prescribed burning anticipated with either alternative would contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses.

Floodplain: No developments or effects of development by the BLM would be anticipated in a floodplain with either alternative. Executive Order 11988 was enacted to "avoid to the extent possible the long-term and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative."

Invasive and Non-Native Species: Some of the activities and land uses would introduce and/or spread noxious weeds. The management guidelines, description of impacts, and resource considerations (Appendix A) provide specific discussion of invasive and non-native species guidance. The proposed alternative (Alternative B) would provide clearer guidance for wildland fire suppression, rehabilitation, prescribed burning, and other hazardous fuels reduction efforts.

Native American Religious Concerns: Neither alternative would interfere with the inherent right of freedom to believe, express, and exercise traditional religions, including access to religious sites, use and possession of

sacred objects, and freedom to worship through ceremonials and traditional rites as established in the American Indian Religious Freedom Act of 1978.

Threatened or Endangered Species: Fire related actions were analyzed concerning impacts to threatened or endangered species and impacts to habitat of such species as provided for in the Endangered Species Act of 1973. In Montana and the Dakotas, 7 species are listed as endangered, 6 are listed as threatened, and 1 is proposed. Designated BLM sensitive species include 26 species of birds, 15 species of mammals, 7 species of reptiles and amphibians, 11 species of fish, and 28 species of plants. Table 5 summarizes the presence of species by Field Office that are federally listed as Threatened or Endangered and species proposed for federal listing. In addition, standards are listed which are necessary to reduce potential adverse effects. These standards are required mitigation to insure that effects from the proposed action would be insignificant or discountable and therefore Not Likely to Adversely Affect the species.

Wastes, Hazardous or Solid: Activities associated with either alternative should be conducted to be in compliance with the Resource Conservation and Recovery Act (RCRA) which provides "cradle to grave" control of hazardous waste and solid wastes by imposing management requirements on generators and transporters of the wastes. Spills of retardant, fuels, and other chemicals may be subject to the spill reporting requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or Clean Water Act. These reporting requirements are contained in the National Contingency Plan (40 CFR Part 300). In general, with "proper housekeeping procedures", compliance with these environmental laws and regulations should not be a significant concern for any of the activities associated with the two alternatives.

Water Quality: The Safe Drinking Water Act of 1974 establishes protective measures for culinary water systems by providing standards which regulate allowable contaminant levels. This would not be affected by either fire management alternative. The Clean Water Act as amended by The Water Quality Act of 1987 provides national policy and mandates the control of non-point sources of pollution. Agencies are to develop and implement programs to meet the goals of this act through the control of both point and non-point pollution. Appendix A contains guidance related to water quality.

Wetlands/Riparian Zones: The impacts to riparian zones and wetlands were considered and addressed in the impact analysis. Management considerations must comply with Executive Order 11990, Protection of Wetlands, which

TABLE 5 REQUIRED THREATENED AND ENDANGERED SPECIES MITIGATION STANDARDS

Species (Status) (E) Endangered (T) Threatened (P) Proposed	Field Offices* With Documented Occurrence	Standards for fire suppression, prescribed burning, and other fuel reduction efforts. See Appendix A for complete standards.
Bald Eagle (E)	MT 010,020,030,040,050,064,070,092,100	BE1,BE2,BE3,BE4,BE5
Least tern (interior population) (E)	MT 020,030,040	LT1,LT2,LT3,LT4
Mountain Plover (P)	MT 010,020,060,064,070,090,092	MP1,MP2,MP3,MP4
Piping Plover (T)	MT 020	PP1,PP2,PP3,PP4
Whooping Crane (E)	MT 020, 050	WC1,WC2,WC3,WC4
Black-footed ferret (E)	MT 040, 090	BF1,BF2,BF3
Canada Lynx (T)	MT 050, 070, 100	CL1,CL2,CL3,CL4,CL5,CL6,CL7
Gray Wolf (E)	MT 010,050, 070, 100	GW1,GW2
Grizzly Bear (E)	MT 060,050,100	GB1,GB2,GB3,GB4,GB5,GB6
Bull Trout (T)	MT 100	BT1
Pallid Sturgeon (E)	MT 020,030,040,060 ,064, 090,092	PS1,PS2
Ute Ladies'-tresse (T)	MT 050, 070	UL1,UL2,UL3,UL4,UL5
Water Howellia (T)	none	WH1,WH2,WH3,WH4,WH5
Western Prairie Fringed Orchid (T)	none	WP1,WP2,WP3,WP4,WP5

*010 = Billings Field Office (FO)

020 = Miles City FO

030 = North Dakota FO

040 = South Dakota FO

050 = Dillon FO

060 = Lewistown FO

064 = Havre Field Station

070 = Butte FO

090 = Malta FO

092 = Glasgow Field Station

100 = Missoula FO

requires federal agencies to minimize the destruction, loss, or degradation of wetlands while preserving and enhancing their natural and beneficial values on federal property. The order restricts most activities that could potentially affect wetlands administered by the Federal government. Activities mentioned in the EO include federal activities and programs affecting land use.

Wild and Scenic Rivers: BLM currently manages only one area designated as a Wild and Scenic River. The Upper Missouri National Wild and Scenic River (UMNWSR) is located between Fort Benton and US Highway 191 in northcentral Montana. This 149 mile stretch of river flows generally west to east through Chouteau, Blaine, Fergus and Phillips counties. Fire management guidance from the Upper Missouri National Wild and Scenic River management plan is incorporated into the proposed fire management plan (Alternative B) for the Lewistown and Malta Field Offices.

Wilderness: Forty BLM sites with a total of 452,563 acres within Montana are Wilderness Study Areas (WSAs) and one 6,000 acre site is a Wilderness Area. Wilderness Areas and WSAs are shown on Map 2. The WSAs meet the criteria set forth for potential wilderness designation under the Wilderness Act of 1964, which includes size, influence of man, absence of human habitation, and provides opportunities for solitude or primitive and unconfined type of recreation. All Wilderness and WSAs are classified as VRM Class I unless specifically exempted from this classification in a Resource Management Plan.

Because of their designations as WSAs or Wilderness, and due to their Class I VRM designation, special consideration and restrictions must be applied in wildland fire suppression, rehabilitation, prescribed fire and other hazardous fuel reduction efforts in these areas. This guidance and direction is contained in Appendix A, and also in the Fire Management Plan for each Field Office (Appendices B-J). Table 6 groups these areas by Field Office.

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MAP 2 WILDERNESS AND WILDERNESS STUDY AREAS

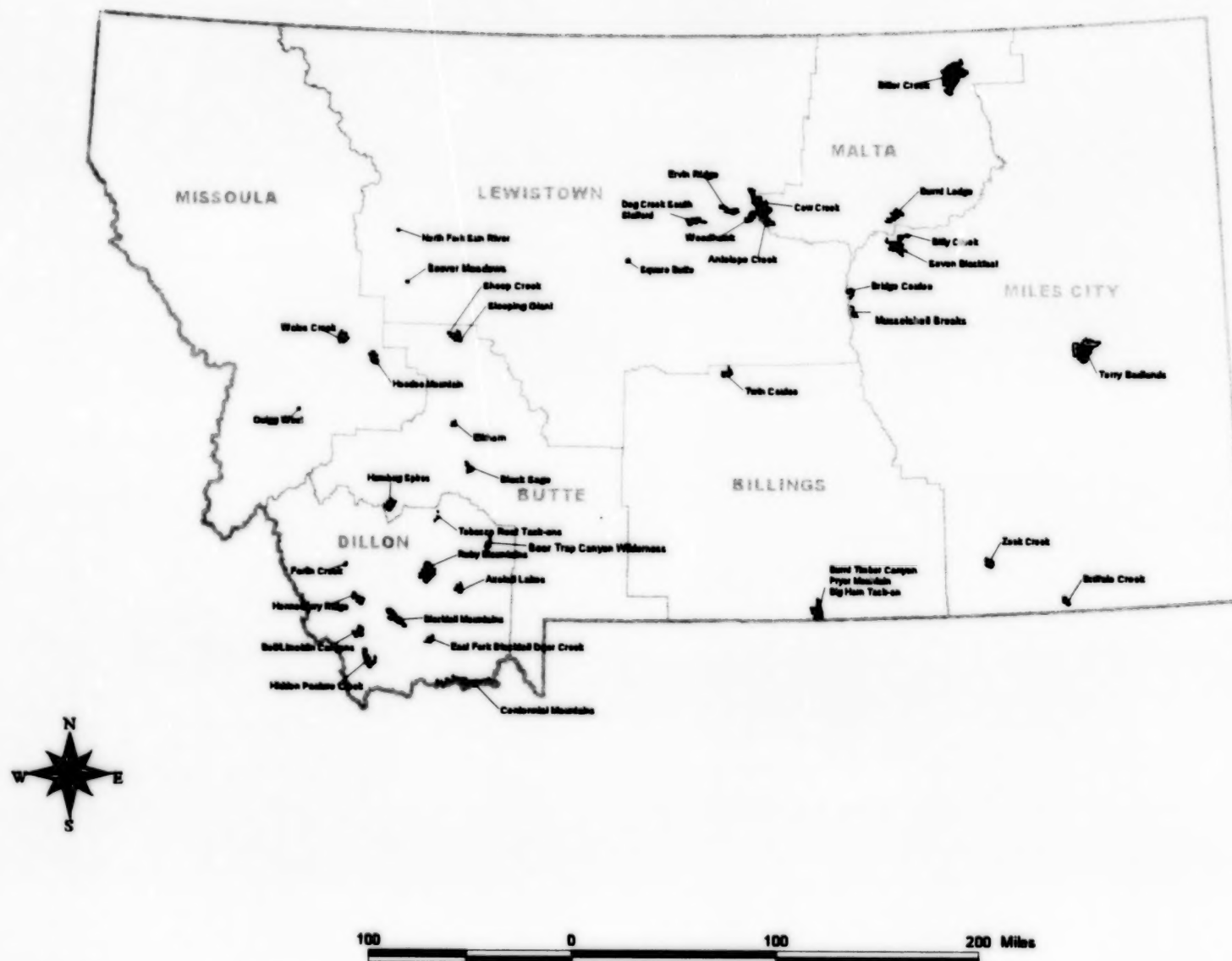


TABLE 6
BLM WILDERNESS AND WILDERNESS STUDY AREAS

FIELD OFFICE	WSA or WILDERNESS	ACRES	CATEGORY AND FIRE MGMT. ZONE
BILLINGS	Burnt Timber Canyon MT-067-205	3,430	Category B. Pryor Mountain FMZ
	Pryor Mountain MT-067-206	13,397 (4,352 additional acres of the Pryor WSA in Wyoming)	Category B. Pryor Mountain FMZ
	Big Horn Tack On MT-067-207	3,308 (353 additional acres of BH tack-on in Wyoming)	Category B. Pryor Mountain FMZ
	Twin Coulee MT-067-212	6,870	Category B. Twin Coulee WSA FMZ
BUTTE	Humbug Spires MT-ISA-003	11,175	Category C. McCartney-Rochester FMZ
	Sleeping Giant/Sheep Creek MT-075-111	10,454	Category C. Sleeping Giant-Sheep Creek FMZ
	Black Sage MT-075-115	5,926	Category C. Three Forks FMZ
	Yellowstone River Island MT-074-133	53	Category A. Bozeman-Livingston Scattered Tracts FMZ
	Elk Horn MT Section 202 MT-075-114	(3,585)	Category C. Elkhorn Mountains FMZ
DILLON	Bear Trap Canyon Wilderness	6000	Category C. East Madison FMZ
	Ruby Mountains MT-076-001	26,611	Category D. North Rubys FMZ
	Blacktail Mountains MT-076-002	17,497	Category C. Blacktail Mountains FMZ
	East Fork, Blacktail Deer Creek MT-076-007	6,230	Category C. Sweetwater-Ruby FMZ
	Hidden Pasture Creek MT-076-022	15,509	Category C. Tendoy Mountains FMZ
	Bell/Limekiln Canyons MT-076-026	9,650	Category C. Tendoy Mountains FMZ
	Henneberry Ridge MT-076-028	9,806	Category C. Blacktail-Horse Prairie FMZ
	Farlin Creek MT-076-034	1139	Category C. Southeast Foothills-Pioneers FMZ
	Axolotl Lakes MT-076-069	7,804	Category C. Gravelly Mountains FMZ
	Centennial Mountains MT-ISA-002	27,691	Category C. Centennial FMZ
	Tobacco Root Tack On (SECTION 202)	(860)	Category C. Tobacco Root Mountains FMZ

TABLE 6 (continued)
BLM WILDERNESS AND WILDERNESS STUDY AREAS

FIELD OFFICE	WSA or WILDERNESS	ACRES	CATEGORY AND FIRE MGMT. ZONE
LEWISTOWN *Management responsibility is shared with Malta FO	Square Butte MT-ISA-004	1,947	Category B. Prairie Grass, Brush, and Agricultural Lands FMZ
	Stafford MT-068-250	4,800	Category C. Missouri Breaks FMZ
	Ervin Ridge MT-068-253	10,200	Category C. Missouri Breaks FMZ
	Cow Creek MT-066-256	34,050	Category C. Missouri Breaks FMZ
	Dog Creek South MT-068-244	5,150	Category C. Missouri Breaks FMZ
	Woodhawk MT-068-246	8,100	Category C. Missouri Breaks FMZ
	Beaver Meadows Section 202	(595) Study incomplete	Category B. Prairie, Grass, Brush and Agricultural Lands FMZ
	North Fork Sun River Section 202	(196) Study incomplete	Category C. Rocky Mountain Front FMZ
MALTA	Burnt Lodge MT-065-278	13,730	Category B. Grass and Range Lands FMZ
	Bitter Creek MT-064-356	59,600	Category B. Grass and Range Lands FMZ
	Antelope Creek MT-065-266	12,350	Category C. Missouri Breaks FMZ
MILES CITY	Billy Creek MT-024-633	3,450	Category C. Special Management Areas FMZ
	Seven Blackfoot MT-024-657	20,330	Category C. Special Management Areas FMZ
	Bridge Coulee MT-024-657	5,900	Category C. Rural Interface FMZ
	Musselshell Breaks MT-024-677	8,650	Category C. Rural Interface FMZ
	Terry Badlands MT-024-684	44,910	Category B. Rural Interface FMZ
	Zook Creek MT-027-701	8,438	Category C. Special Management Areas FMZ
	Buffalo Creek MT-027-702	5,650	Category C. Special Management Areas FMZ
MISSOULA	Wales Creek MT-074-150	11,580	Category C. Blackfoot FMZ
	Hoodoo Mountain MT-074-151A	11,380	Category C. Hoodoo FMZ
	Quigg West MT-074-155	520	Category B. Flintrock FMZ

Vegetation

Prior to European settlement, fire was the most common and widespread influence on the landscape in the intermountain west (Gruel 1983). The break-up and reduction of fuels caused by grazing and cultivation that came with European settlement, and then the introduction of organized fire suppression, have caused a drastic decrease in fire occurrence and size (Gruell 1983; Swetnam 1990). With the omission of fire as a dominant ecological factor on many sites has come significant changes in vegetation. Successional changes that have occurred on some sites would unlikely have occurred in the pre-European settlement environment, where frequent fires suppressed woody vegetation (Gruell 1983). Increase in density of woody species has occurred on some sites, as well as invasion of woody species onto sites where frequent fire used to preclude their dominance. Fire exclusion has had the most marked effect on ecotones, tension zones between two different community types. Natural fires replaced fire sensitive woody species with species that were more fire adapted.

Fire affects the productivity of plants. Where fire is precluded, plant communities may be affected by increased plant competition. The extent of these impacts depends on weather conditions before and after a burn; time of the year (whether plants are growing or dormant); physical features of the site; particular species; plant life form (shrub, grass, tree, and so forth), method of reproduction, stage of maturity and vigor; amount of fuel available and its moisture content; severity and intensity of the burn; rate of fire spread; flame length; depth and duration of heat penetration into organic and soil layers; and frequency of fires. Prefire and postfire management also affects composition and productivity of plant communities.

Fire can affect postfire plant productivity. Productivity may decrease during the initial postfire recovery period, then increase after several years. Productivity may increase after the first growing season. Total productivity may not change, but it can shift among classes of plants on the site, such as from conifers that are killed by a fire to shrubs, grasses, and forbs. Total vegetative productivity may actually decrease but shift from less desirable to more desirable species, as from woody plants to grasses and forbs. Immediate productivity increases are usually more likely if vegetative reproduction or regeneration occur, than if the site must reestablish from seed.

Fire can affect plant competition by changing the numbers and species of existing plants or altering site conditions. In a postfire situation, established perennial plants usually

have an advantage over plants that are developing from seed, because they take up water and nutrients from an existing root system while seedlings must develop a new root system. Sprouting plants may rapidly develop a crown that can shade out other plants or limit their growth. Natural regeneration of shrubs may severely limit growth of naturally occurring or planted conifers because of competition for light or moisture (Stein 1986). Grass seeded for postfire erosion control in forested areas may overtop conifer seedlings. Litter from seeded grasses may also increase the flammability at the site to much higher levels than would occur if only native vegetation recovered on the site (Cohen 1986 as cited in Barro and Conard 1987). A second fire after a short-term interval might kill all seedlings of native species before they have produced much seed. Therefore, numbers and vigor of native plants would be further reduced. Cheatgrass seedlings can grow roots at much cooler soil temperatures than many native perennial grass seedlings and use up soil moisture in the spring before other species get their roots down into the soil profile (Thill et al. 1984).

On sites that are not burned, some species may have a competitive advantage. For example, junipers can take up increasing amounts of soil water in sagebrush/grass communities they have invaded and eventually exclude most other species because of moisture limitations. Grass production tends to decrease as sagebrush cover increases, again because of competition for water. Young stands of conifers that develop in the absence of fire beneath mature overstories of ponderosa pine compete with the mature trees for moisture and nutrients, weakening them and making them susceptible to insects and disease. Depending on the site, prescribed fire or fire in combination with other treatments is often the most efficient and ecologically sound way to manage these plant communities.

If burning occurs in close association with heavy use of the plant community by livestock or wildlife, either before or after the burn, plant recovery may be delayed or prevented because heavy prefire use may deplete plant carbohydrate reserves. Heavy postfire use of perennial plants in the first growing season after a fire is likely to cause the most harm, particularly in arid and semi-arid range communities (Trlica 1977). Livestock and wildlife are often attracted to burned areas because of increased palatability, availability, and the earlier spring greenup that often occurs on burned rangelands and grasslands. In most cases two full growing seasons at postfire rest are necessary before plants can sustain much utilization (Wright and Bailey 1982). A longer recovery period is necessary if weather has been unfavorable for growth or if establishment of plants from seeds is required to completely revegetate the site. Desert plants required more than seven years of recovery after

moderate defoliation (Cook and Child 1971, as cited in Trlica 1977), and some shrubland sites may require lengthy postfire rest if recovery of browse species is desired.

For some plant communities in poor condition or dominated by undesirable species, it may be necessary to artificially reseed the area after burning because natural revegetation by desired species is unlikely to occur.

The observed responses of plants to fires depend on the above factors and other localized conditions. Because these factors determine the outcome of a particular wildland fire or prescribed burn, onsite management decisions can alter fire effects to meet specific goals.

In general, prescribed fires are planned with specific goals and conducted under constraints to ensure that the fire is contained, that fire and resource objectives are met, and that long-term site productivity is maintained or enhanced.

A particular plant species may or may not be considered desirable on a treatment site, depending on the specific objective of the treatment. The following describes broad groups of plant species and the effects of fire on the species or group of species.

Table 7 shows the percentage of landcover type on BLM land by fire management zone. Table 8 shows the total amount of each type of landcover and the percent managed by the BLM in each fire management zone.

TABLE 7
PERCENT LAND COVER* ON BLM LAND BY FIRE MANAGEMENT ZONE

Fire Management Zone	Acres of BLM	Urban/ Agriculture	Grass lands	Shrub lands	Forest lands	Riparian
Billings Field Office						
1. Billings Grasslands	232,500	1%	43%	47%	3%	6%
2. Roundup	83,200	<1%	48%	44%	7%	1%
3. Pryor Mountains	38,800	—	42%	30%	26%	2%
4. Big Timber/Absaroka	18,100	—	38%	12%	48%	2%
5. Twin Coulee WSA	7,000	—	3%	3%	94%	<1%
6. Pompeys Pillar Nat. Monument / ACEC	450	44%	4%	11%	—	41%
Butte Field Office						
1. Absaroka Foothills	3,900	—	25%	17%	58%	—
2. Big Belt Mountains	1,300	—	51%	4%	45%	—
3. Big Hole River Corridor	7,300	<1%	37%	55%	7%	—
4. Blackfoot (See Missoula FO)	74,500	—	11%	4%	85%	—
5. Boulder River	14,200	<1%	14%	14%	72%	—
6. Clancy/Marysville	26,000	—	28%	6%	66%	—
7. Elkhorn Mountains	68,500	<1%	31%	25%	44%	—
8. Fleecer Mountains	17,900	<1%	11%	39%	50%	—
9. Hoodoo (See Missoula FO)	33,500	—	5%	3%	92%	—
10. McCartney/Rochester	27,500	<1%	32%	34%	34%	—
11. North Hills	6,400	—	28%	8%	64%	—
12. Pipestone	40,500	<1%	52%	15%	33%	—
13. Scratchgravel Hills	2,900	<1%	86%	1%	13%	—
14. Sleeping Giant/Sheep Creek	9,800	—	43%	2%	55%	—
15. Spokane Hills and North	6,500	—	40%	6%	54%	—
16. Three Forks	29,700	<1%	52%	15%	33%	<1%
17. Wise River Townsite	1,300	—	8%	29%	63%	—
18. Bozeman/Livingston Scattered Tracts	<i>Information on acreage totals and composition is unknown</i>					

TABLE 7 (continued)
PERCENT LAND COVER* ON BLM LAND BY FIRE MANAGEMENT ZONE

Fire Management Zone	Acres of BLM	Urban/ Agriculture	Grass lands	Shrub lands	Forest lands	Riparian
Dillon Field Office						
1. Beaverhead Mountains	29,750	2%	12%	39%	44%	3%
2. Beaverhead/Jefferson	21,700	<1%	68%	20%	12%	—
3. Big Hole River Corridor	7,300	<1%	37%	55%	7%	—
4. Big Sheep/Medicine Lodge Backcountry Byway	49,800	<1%	17%	69%	11%	2%
5. Blacktail Mountains	21,700	—	28%	8%	64%	—
6. Blacktail/Horse Prairie	241,200	<1%	26%	70%	3%	<1%
7. Centennial	146,100	<1%	26%	50%	24%	—
8. East Madison	11,200	—	36%	8%	56%	—
9. Gravelly Mountains	38,400	<1%	26%	8%	66%	—
10. Madison Valley	20,700	<1%	50%	26%	24%	—
11. McCartney/Rochester	94,300	<1%	67%	27%	6%	—
12. North Rubys	26,800	—	11%	6%	83%	—
13. SE Foothills/Pioneers	101,200	<1%	29%	64%	7%	<1%
14. Sweetwater/Ruby	89,000	<1%	27%	54%	19%	—
15. Tendoy Mountains	55,900	<1%	18%	64%	16%	1%
16. Tobacco Root Mountains	31,600	<1%	38%	22%	39%	—
17. Wise River Townsite	1300	—	12%	28%	60%	—
Lewistown Field Office						
1. Judith	23,700	<1%	10%	4%	84%	2%
2. Little Snowy Mountains	9,000	—	18%	5%	75%	2%
3. Missouri Breaks	563,900	<1%	37%	43%	18%	2%
4. North and South Moccasins	4,700	—	13%	4%	79%	4%
5. Prairie Grass/Brush & Ag. Lands	689,500	3%	74%	14%	7%	2%
6. Rocky Mountain Front	13,300	—	25%	24%	50%	1%
Malta Field Office						
1. Grass & Range Lands	1,659,300	1%	61%	35%	1%	2%
2. Little Rocky Mountains, Timber	28,600	—	15%	6%	77%	2%
3. Missouri Breaks Uplands	18	—	33%	45%	5%	17%
Miles City Field Office						
1. Rural Interface Areas	10,300	1%	55%	24%	18%	2%
2. Special Management Areas	70,500	<1%	42%	34%	23%	1%
3. Missouri-Musselshell River Breaks	171,700	<1%	43%	35%	21%	<1%
4. Knowlton-Locate	12,300	—	48%	25%	23%	4%
5. Custer National Forest	136,100	<1%	38%	43%	17%	2%
6. Cedar Breaks	48,500	<1%	70%	17%	11%	1%
7. Mixed Grass Prairie-Sagebrush	1,904,000	<1%	60%	33%	3%	3%
Missoula Field Office						
1. Blackfoot	74,500	—	11%	4%	85%	—
2. Clark Fork Front	18,500	<1%	17%	7%	76%	—
3. Flintrock	25,700	<1%	19%	6%	74%	<1%
4. Hoodoo	33,500	—	5%	3%	92%	—
North and South Dakota Field Offices						
<i>Information on Landcover Type and acreage unavailable</i>						

*Information derived from The Montana Gap Analysis Project (Sept. 1998)

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TABLE 8
LAND COVER* BY FIRE MANAGEMENT ZONE

Fire Management Zone	Urban/Agriculture		Grasslands		Shrublands		Forest Lands		Riparian	
	Total Acres	% BLM	Total Acres	% BLM	Total Acres	% BLM	Total Acres	% BLM	Total Acres	% BLM
Billings Field Office										
1. Billings Grasslands	1,071,000	<1	3,670,000	3	2,179,600	5	1,114,200	<1	730,500	2
2. Roundup	52,600	<1	348,300	12	226,200	16	172,000	3	26,700	3
3. Pryor Mountains	197	-	40,000	40	28,700	40	50,700	40	3,400	2
4. Big Timber/Absaroka	31,100	-	397,600	2	112,500	2	152,600	6	54,900	<1
5. Twin Coulee WSA	-	-	1,000	19	700	28	10,800	62	200	18
6. Pompeys Pillar Nat. Monument / ACEC	230	87%	20	100	50	100	-	-	180	100
Butte Field Office										
1. Absaroka Foothills	4950	-	24,400	4	4750	14	31,700	7	700	-
2. Big Belt Mountains	200	-	83,400	<1	13,300	<1	50,000	1	850	-
3. Big Hole River Corridor	1,100	1	11,700	23	16,500	24	21,200	3	-	-
4. Blackfoot (See Missoula FO)	8,300	-	116,400	7	23,700	13	231,000	27	-	-
5. Boulder River	600	1	44,500	4	17,600	12	209,300	5	-	-
6. Clancy/Marysville	4,500	-	81,300	9	15,400	10	164,600	10	-	-
7. Elkhorn Mountains	29,900	<1	166,800	13	63,400	27	204,700	15	-	-
8. Fleecer Mountains	5,400	<1	81,200	2	53,600	13	137,700	6	-	-
9. Hoodoo (See Missoula FO)	400	-	209,100	<1	43,600	2	179,800	17	-	-
10. McCartney/Rochester	400	1	29,600	30	19,400	48	31,000	30	-	-
11. North Hills	1,000	-	15,000	12	3,800	13	10,900	38	-	-
12. Pipestone	13,800	<1	163,800	13	25,500	24	159,300	8	-	-
13. Scratchgravel Hills	8,300	<1	34,200	7	3,900	1	11,200	3	-	-
14. Sleeping Giant/Sheep Creek	-	-	4,200	97	200	100	5,800	92	-	-
15. Spokane Hills and North	18,300	-	69,000	4	7,000	6	26,300	13	-	-
16. Three Forks	23,400	<1	226,200	7	50,600	9	48,850	20	2,500	1
17. Wise River Townsite	-	-	4,000	3	2,200	17	2,300	35	-	-
18. Bozeman/Livingston Scattered Tracts										
<i>Information on Landcover type and acreage unavailable</i>										
Dillon Field Office										
1. Beaverhead Mountains	19,100	3	117,900	3	101,600	11	509,900	3	23,000	4
2. Beaverhead/Jefferson	133,700	<1	437,000	3	93,900	5	36,000	7	-	-
3. Big Hole River Corridor	1,100	1	11,700	23	16,500	24	21,200	3	-	-
4. Big Sheep/Medicine Lodge Backcountry Byway	1,600	3	19,000	45	62,200	5	11,300	50	7,600	15
5. Blacktail Mountains	-	-	11,400	53	5,900	30	18,100	76	-	-
6. Blacktail/Horse Prairie	19,000	2	200,500	35	373,000	51	40,500	26	30,700	4
7. Centennial	8,200	<1	207,600	18	240,800	30	94,500	38	-	-
8. East Madison	4,100	-	91,100	4	13,400	7	282,000	2	400	-
9. Gravelly Mountains	800	<1	262,800	4	48,300	7	314,700	8	-	-

10. Madison Valley	32,300	<1	261,200	4	68,500	1	42,100	11	-	-
11. McCartney/Rochester	7,300	1	128,400	49	46,200	56	22,300	25	-	-
12. North Rubys	600	-	7,300	23	3,400	24	13,800	87	-	-
13. SE Foothills/Pioneers	6300	<1	65,100	45	114,300	57	32,400	21	2,400	11
14. Sweetwater/Ruby	3,200	<1	117,700	20	166,200	29	39,700	43	-	-
15. Tendoy Mountains	600	6	31,000	33	65,700	54	35,100	26	3,300	27
16. Tobacco Root Mountains	4,400	<1	88,700	14	31,400	23	171,700	7	-	-
17. Wise River Townsite	-	-	4,000	3	2,200	17	2,300	35	-	-
Lewistown Field Office										
1. Judith	9,800	1	74,300	3	15,200	6	56,700	35	15,800	2
2. Little Snowy Mountains	-	-	25,000	6	6,000	7	39,900	17	4,300	4
3. Missouri Breaks	107,300	3	583,400	36	451,700	54	154,000	68	9,500	17
4. North and South Moccasins	5	-	2,500	24	800	26	10,400	36	900	21
5. Prairie Grass/Brush & Ag. Lands	6,229,000	<1	9,151,300	6	1,237,700	8	1,545,100	3	669,300	2
6. Rocky Mountain Front	-	-	23,700	14	19,800	16	33,300	20	1,100	13
Malta Field Office										
1. Grass & Range Lands	949,500	2	2,541,700	40	885,700	65	51,100	26	166,900	21
2. Little Rocky Mountains, Timber	50	-	28,300	15	6,700	26	25,800	86	2,000	27
3. Missouri Breaks Uplands	1400	-	80,300	-	165,100	-	57,700	-	6,800	-
Miles City Field Office										
1. Rural Interface Areas	10,500	1	47,400	12	12,900	19	22,800	8	5,400	3
2. Special Management Areas	6,400	1	77,700	38	46,500	52	25,200	64	6,500	14
3. Missouri-Musselshell River Breaks	36,700	1	235,100	31	125,100	48	80,100	46	6,900	9
4. Knowlton-Locate	34	<1	18,000	33	9,000	34	5,800	48	1,900	30
5. Custer National Forest	86,100	<1	704,000	7	476,200	12	350,700	7	89,200	3
6. Cedar Breaks	600	13	69,300	49	18,500	43	9,500	58	2,600	28
7. Mixed Grass Prairie-Sagebrush	3,515,900	<1	9,958,500	12	4,028,500	16	641,600	9	944,500	6
Missoula Field Office										
1. Blackfoot	8,300	-	116,400	7	23,700	13	231,000	27	-	-
2. Clark Fork Front	2,900	<1	42,200	5	16,200	8	187,300	7	-	-
3. Flintrock	11,500	-	214,600	2	54,400	3	380,900	5	2,600	5
4. Hoodoo	400	-	209,100	<1	43,600	2	179,800	17	-	-
North and South Dakota Field Offices										
<i>Information on Landcover Type and acreage not available</i>										

*Information derived from the Montana Gap Analysis Project (Sept. 1998)

Grasslands: Grasslands occur at elevations ranging from 3,000 to over 9,000 feet where annual precipitation varies from 8 to 30 inches (Garrison 1977, Mueggler and Stewart 1980), at least half of which usually falls during the growing season. Grasslands occupy a variety of topographical positions, from level areas or valley floors, to alluvial benches and foothills, to steep mountain slopes. Soil characteristics vary accordingly, ranging from deep and loamy, to poorly drained or fairly dry and rocky, or mildly alkaline to mildly acidic (Mueggler and Stewart 1980). The grass component of these communities is usually the most productive, followed by forbs, and then shrubs.

Important grasses in grass communities include bromes, bluegrasses, sedges, wheatgrasses, fescues, needle grasses, hairgrasses, reedgrasses, bentgrasses, and junegrass. The forb component varies with site, latitude, and management and is diverse throughout the region.

Grasslands are common in eastern Montana and the Dakotas. Sedges and cool season grasses, such as needlegrasses, and wheatgrasses dominate the grassland communities of Montana and North and South Dakota. Warm season grasses, particularly blue grama, are also part of these communities. Other important grasses in mixed grass communities include needlegrass, prairie sandreed, junegrass, sand dropseed, buffalograss, side-oats grama, and little bluestem. Forbs may also be an important component of these communities.

Tall grass communities in the plains grassland are restricted to certain soil types and areas where grazing history has not been severe (Brown 1985). This type is much more extensive in the true prairie of the Dakotas. Tall grass communities are dominated by big bluestem, little bluestem, Indiangrass, switchgrass, and side-oats grama.

The plains grasslands evolved with grazing by native herbivores, and many of the grasses are well adapted to grazing. Climate is the dominant factor controlling these grasslands, but periodic fire was also an important factor in limiting woody vegetation to mosaics or a savanna situation (Wright et al. 1980). Fire suppression has led to the establishment of fire disclimax associations of shrubs in some areas (Brown 1982).

The effect of fire on grasses depends upon the growth form and how burning influences soil moisture and other environmental and prescribed burning conditions. Many of the grass species are fairly fire resistant and can produce new shoot growth even after moderate to high-severity burns.

When desirable understory plants are present within the sagebrush community, prescribed fire can release these

species. Spring or fall fires are most desirable and effective because the soils are moist and cool, and the burning is more selective. Sprouting shrubs such as bitterbrush, mountain snowberry, and gamble oak respond favorably, and perennial grasses are benefited. Burning can be used to increase edge effect and increase plant diversity (Bowns 1990).

Repeated or early summer burning reduces perennial grasses and may allow cheatgrass to invade and maintain populations (Wright and Bailey 1982). Bunchgrasses that contain dense plant material in their bases are more damaged than coarse-stemmed and rhizomatous species (Wright and Bailey 1982). Needle-and-thread grass, needlegrass, and Idaho fescue are the dominant grasses that are easily harmed by fire. Plants that have accumulations of dense culms at their base tend to concentrate heat if the fire occurs during a dry period. Large diameter bunches of these three species have all been reported to sustain more damage from fire than smaller diameter bunches. Both needlegrass species have been observed to reproduce from seed after fires. The greater amount of damage to these plants occurs either if they are burned when actively growing or have green tissue; when they are more sensitive to fire temperatures; or when basal material is very dry, can ignite and smolder, and can concentrate heat. Prescribed fires with an objective of enhancing or maintaining grasses would not be scheduled when key species are more sensitive to fire. Bunchgrass plants that survive a fire can return to preburn coverage and production within 2 years (West and Hassan 1985), but the recovery time may be shorter or much longer, depending on the amount of damage sustained by the plant, its recovery potential, site productivity, postfire weather, and postfire animal use.

Perennial forbs generally respond better to burning than do bunchgrasses (Britton and Ralphs 1978), probably because their growing points are protected by soil layers to a greater extent than are grasses. Fall burning does not harm most forbs because many of them are dry and disintegrated by that time (Wright 1985). However, forbs that are still green are still very susceptible to fall fires (Wright 1985), as are forbs such as some of the *Antennaria* spp. and *Phlox* spp. (Pechanec and Stewart 1944) that have growth points at the surface. Perennial forbs can recover from summer burning in one year (West and Hassan 1985). Balsamroot has been observed to respond very well to even a summer wildfire after drought conditions, because it sprouts each year from well below the soil surface (Miller 1987).

Burning grass results in responses similar to those seen in sagebrush-grass communities. Large bunch-grasses are more affected than small grasses with coarse stems, and rhizomatous species tolerate fire well (Everett 1987a). Perennial forbs are usually only slightly damaged by fire,

except those mat-forming species such as *Antennaria* spp. (Wright and Bailey 1982, Everett 1987a). Cheatgrass may increase after burning in these communities (Wright and Bailey 1982) if it is present in the stand or in the area before burning, if few residual native bunchgrass plants remain on the site, or if good postfire grazing management practices are not followed. If bunchgrass communities are in good condition when the site is treated, cheatgrass may persist for only a few years.

Prairie shortgrasses are generally harmed by fires during dry years. Buffalograss, annual bluegrass, and western wheatgrass may take three or more years to recover (Wright and Bailey 1982). During years with above normal spring precipitation, these grasses can tolerate fire with no herbage yield reduction following the first growing season (Wright 1974a). Burning usually increases production of switchgrass but decreases little bluestem production where these grasses occur (Wright and Bailey 1982).

Important mixed prairie grasses include green needlegrass and prairie sandreed (reedgrass). Needlegrass is fairly sensitive to fire, although the effect can be moderated by burning conditions and site characteristics. Needlegrass is less tolerant to fire when soils are dry or where plants are large in diameter and have more fuel (Wright and Klemmedson 1965, as cited in Tirmenstein 1987e). Prairie sandreed is a strongly rhizomatous grass that is fire tolerant when dormant and revegetates a burned area with new shoots from rhizomes. It responds more favorably to spring fires than to fall fires (Lyon and Stickney 1976, as cited in Uchytel 1988).

The tolerance of forbs to burning depends upon the timing of the fire relative to active plant growth (Wright and Bailey 1982). Those forbs that start growing after the burning season are least affected, because they have the entire growing season to recover from any injury that the fire may have caused.

Important native grasses include rough fescue, oatgrasses, and mountain brome. Rough fescue is a large-diameter, coarse stem med bunchgrass that seems well adapted to periodic burning. It is susceptible to damage from fires during hot dry weather, although it has benefited from spring and fall prescribed fires. In areas where it has not been grazed or burned for many years, accumulations of litter may ignite and smolder for a long time after a flaming front has passed, causing basal bud mortality. Fescue is also particularly sensitive to burning during the activate growing season (Sinton 1980 in McMurray 1987e). Antos et al. (1983, as cited in McMurray 1987e) suggest that the most beneficial fire frequencies for rough fescue are about every 5 to 10 years. Little information is available about the response of oatgrasses to fire, although other oatgrass

species in the Pacific Northwest are reported to be moderately resistant to fire. One-spike oatgrass, a densely tufted to matted perennial bunchgrass, was reported to increase in basal cover after two spring prescribed fires in southwest Montana (Nimir and Payne 1978). Mountain brome, a short-lived perennial bunchgrass with shallow roots, regained 76 percent of its preburn cover within 12 weeks, compared to a control, after one of those same spring fires studied by Nimir and Payne.

Shrublands: Shrubs are generally less tolerant of fire than grasses. However the season and intensity of fire on shrublands also determines the effects of fire. Detailed information about fire effects is summarized from the Northern Rockies Interagency Fire and Aviation Management Fire Effects Information System found on the internet at www.fs.fed.us/database/feis/welcome.htm.

Sagebrush is the most common category of shrublands in Montana. Dominant species in these communities include basin big sagebrush, black sagebrush steppe, mountain big sage, Wyoming big sage, and silver sagebrush.

Mixed xeric shrubs are associated with dry rocky sites. Dominant species include bitterbrush, creeping juniper, greasewood, mountain mahogany, rabbitbrush, and shadscale. Mixed xeric shrubs are the dominant species with 20 to 50 percent cover. This category of shrublands is found on about eight percent of public lands in Montana.

Other shrub species found in Montana and the Dakotas include juniper, silver sagebrush, buffaloberry, sumac, rabbitbrush, western snowberry, gooseberry, red osier dogwood, common chokecherry, American plum, and greasewood.

Environmental diversity has resulted in a comparable variety of species, subspecies, and varieties of sagebrush adapted to specific habitats (Tisdale and Hironaka 1981). Basin big sagebrush and Wyoming big sagebrush usually dominate between 2,000 and 7,000 feet. Basin big sagebrush occupies deep, well-drained alluvial soils where annual precipitation averages 10 to 16 inches, and Wyoming big sagebrush occupies an 8- to 12-inch precipitation zone on shallow soils (Wright et al. 1979). Mountain big sagebrush can be found at elevations from 5,000 to 10,000 feet where annual precipitation varies from 14 to 20 inches (Wright et al. 1979).

Important shrubs include big sagebrush, black sagebrush, low sagebrush, rabbitbrushes, Mormon tea, bitterbrush, snowberry, and horsebrush (Cronquist et al. 1972). Important perennial grasses associated with these shrub communities include bluebunch wheatgrass, Sandberg bluegrass, Idaho fescue, rough fescue, western wheatgrass,

Great Basin wildrye, junegrass, Indian ricegrass, squirreltail, muttongrass, needle-and-thread grass, and Thurber needlegrass. Red brome and cheatgrass are introduced annual grasses that have become abundant in some areas.

The most dependable combination of both moisture and temperature conditions favorable for growth occurs for a short period after snowmelt. Growing season precipitation is less dependable for soil moisture recharge, and higher temperatures cause greater evapotranspirative losses. The grasses and forbs depend on resources in the surface soil in the interspaces between shrubs and therefore have a constrained growing period. Sagebrush can draw its moisture and nutrients from deep in the profile or through fibrous roots near the surface, giving it extreme resistance to environmental extremes (West 1983). Sagebrush is also long-lived (in excess of 40 years), has great reproductive capacity through abundant and consistent seed set, and produces secondary chemical compounds in its foliage that probably discourage herbivory (West 1983). Altogether, these characteristics make sagebrush extremely competitive in this environment (West 1983). Sagebrush is killed by fire, however and insects and fire appear to be its primary environmental vulnerabilities (West 1983).

The fire history of shrublands has not been firmly established, but fire was probably uncommon on drier sites because of sparse fuels, and more frequent, averaging 32 to 70 years, on more mesic sites with greater herbaceous production (Wright et al. 1979).

Big sagebrush and other nonsprouting shrubs are almost always killed by fires and may take decades to recover preburn status in the community (Harniss and Murray 1973). The rate of reestablishment depends on the size of the area burned, postfire grazing management practices, and the subspecies of sagebrush. For example, silver sagebrush plants resprout vigorously after spring burning but may suffer extensive mortality after fall burning (White and Cusive 1983). Curlleaf mountain mahogany is an examples of desirable forage shrubs that is damaged by fire. Target sprouting shrubs, such as greasewood, may be top-killed by fire but will resprout as soon as conditions are favorable (Blaisdell 1953, Britton and Ralphs 1978). Bitterbrush is a species of special interest because it has valuable forage and browse qualities. It reproduces from seed and by resprouting. Because bitterbrush plants die of old age, fire seems to be necessary for maintenance of the species, even though mortality of plants during any fire may be high. Mortality is minimized by burning when soils are moist, either in the spring or late in the fall after plants have become dormant and rain has fallen. Mortality is highest when fuel consumption is high.

Sprouting shrubs, such as western serviceberry, true mountain mahogany, chokecherry, winterfat, saltbush, rabbitbrush, and horsebrush, may regrow quickly postburn (Wright et al. 1979), while shrubs such as bitterbrush, broom snakeweed, and curlleaf mountain mahogany may or may not re-sprout, depending upon fire and postfire conditions. (Wright and Bailey 1982).

Another important shrub is silver sagebrush. Plains and mountain silver sagebrush are an exception to most sagebrush species because they are moderately resistant to fire, being able to produce sprouts from roots and rhizomes. Sprouting decreases as fire severity and heat penetration into the soil increases, particularly after fall fires when the soil is dry. Silver sagebrush rapidly regains preburn cover after spring fires, although coverage is decreased significantly after many fall fires (McMurray 1987a, McMurray 1987b). The most beneficial effects were reported after early spring fires (Anderson and Bailey 1980, as cited in Tirmenstein 1986c), and mortality has been reported after both spring and fall fires. Whether a particular plant sprouts after a fire apparently relates to site characteristics, season of burn, fire intensity, and burn severity. The effect of fire upon prickly pear varies with plant height, stem moisture content, and the amount of associated fuel, because the plant itself will not burn (Humphrey 1974, as cited in Holifield 1987e). It can resprout from any surviving root crowns and by adventitious rooting of remaining pad (Holifield 1987e). Postfire death of prickly pear is often caused by postfire damage by insects, rodents, rabbits, and livestock, or by dehydration (Holifield 1987e).

Forest Lands: Forest lands are a composite of the many high-elevation evergreen conifer and deciduous forest types that occur throughout Montana and the Dakotas. Species dominance varies with altitude, latitude, slope aspect or other topographical position, soil characteristics, and climatic regime. The BLM administers small acreages of these diverse forest types. Important forest communities include climax ponderosa pine, seral ponderosa pine, Douglas fir, Douglas fir mixed with other conifers, aspen, lodgepole pine, and spruce fir.

Climax ponderosa pine exists at lower elevations and on warmer, drier sites. The lower contact is typically with juniper woodland or mountain shrub communities. Upper elevation contacts are usually with mixed conifer types. Old growth ponderosa forests are often park-like, with scattered old trees interspersed with groups of young trees. There is typically a well-developed herbaceous understory. Stands were probably kept open by light fires that periodically burned through the understory. Older trees tolerate fire well, but young trees are easily killed (Daubenmire 1952). In the absence of frequent understory

fires that historically occurred, many stands of ponderosa pine are now dense and stagnant, with thickets of understory reproduction (Wright and Bailey 1982).

On more mesic sites, ponderosa pine will be replaced by other, less fire-tolerant species without understory fires. Ponderosa pine is associated with western larch and Douglas fir in western Montana, where it grades into more moist western larch and Douglas fir forests at higher elevations or more northerly locations. Because ponderosa pine and western larch are the most fire resistant western trees, frequent underburns would favor these species over Douglas fir or grand fir (Wright and Bailey 1982).

Douglas fir occurs in western Montana, generally between the ponderosa pine and spruce fir zones (Wright and Bailey 1982). Ponderosa pine, western larch, aspen, and lodgepole pine are common seral species in this zone (Wright and Bailey 1982). Associated understories may be dominated by bunchgrasses on the most xeric sites, or may be composed of a sparse shrub layer mixed with grasses and forbs (Wright and Bailey 1982).

Quaking aspen is the most widely distributed native North American tree species (DeByle et al. 1985). Its range coincides closely with Douglas fir. Fire is responsible for the abundance and even-aged structure of most stands throughout the West. Without human intervention, fire appears to be necessary for the continued well-being of aspen on most sites (DeByle et al. 1985), and most stands will die out or be replaced by conifers without disturbance.

Lodgepole pine occurs primarily in western and southcentral Montana. At higher elevations, it gives way to spruce fir forest. Lodgepole pine forms dense, often pure stands with little understory. Fire plays an important role in the maintenance of these forests. The Rocky Mountain lodgepole pine contains some proportion of closed cones that retain seeds but quickly release them after fire or cutting (Lotan et al. 1981). Lodgepole pine colonizes burned areas, frequently replacing previous stands of lodgepole pine. Without fire, lodgepole pine may eventually be replaced by ponderosa pine, Douglas fir, Englemann spruce, cedar hemlock, or Englemann spruce/subalpine fir stands. Lodgepole pine may persist as a climax species on sites too cold for Douglas fir or ponderosa pine, too dry for spruce fir, or too wet or infertile for other coniferous species (Wright and Bailey 1982).

The spruce fir forest type is dominated by Englemann spruce and subalpine fir. Limber pine and bristlecone pine are common associates on steep, rocky, and southern exposures. Douglas fir, aspen, lodgepole pine, blue spruce, and white bark pine are also found in this zone. These species often form dense stands with little herbaceous

understory because of shading and considerable litter accumulation. Aspen generally becomes dominant after fire or other disturbance (Brown 1985).

Fire exclusion in any of these forest types adapted to high frequencies of understory fires can lead to accumulations of understory dead woody fuels, as well as the establishment of trees that provide fuel ladders between the surface fuels and the tree crowns, and it has substantially altered forest succession in some forest types (Barrett 1988, Stark 1977). Fire exclusion on forests with long stand replacement cycles results in increased fire hazard because flammability increases over much greater contiguous areas of forest and younger, less flammable stands are no longer present. For example, lodgepole pine stands that have had time to develop an understory of Englemann spruce and subalpine fir are much more flammable than before those species became established. Complete fire protection will allow less fire-tolerant species to replace more fire-tolerant species, as well as permit coniferous species to take over most sites presently dominated by aspen (DeByle et al. 1985).

Mature stands of juniper are frequently too open or contain insufficient herbaceous fuel to carry a fire (Lotan and Lyon 1981). However, burning can easily kill nonsprouting juniper, especially trees less than 4 feet tall (Dwyer and Pieper 1967). Larger trees require heavy amounts of fire fuel within their canopy coverage to crownkill (Jameson 1962). Where understories include sagebrush, large juniper trees can be killed by fire (Bruner and Klebenow 1978).

Postfire recovery of juniper after fire depends on seed reproduction and the rate of reinvasion depends on distance to seed source, the size of the burned area and the presence of dispersal agents. Junipers do not produce seed until they are about 20 to 30 years old.

Older trees are generally more fire resistant as bark thickens and the crown becomes more open, and may be able to survive low intensity fires. It is difficult to kill trees in fairly closed stands of juniper because there is little live or dead fuel on the surface, and a prescribed fire will not carry unless there are extremely high winds, a situation in which risk of fire escape is high. A treatment in juniper stands is to manually cut the trees, leave the slash scattered, wait several years for grasses and shrubs to recover, and then burn the site. This removes most of the dead fuel, greatly reduces the fire hazard, and kills any residual or newly germinated juniper trees. If a site is mechanically or manually treated only, it will probably have enhanced forage and browse production for about 20 years. Prescribed burning of the site about 3 to 5 years after treatment, once an understory has established, will

maintain the productive character of the site for about 50 years (West 1979, as cited in Tiemenstein 1986b, Wright et al. 1979, as cited in McMurray 1986b). If high rates of forage utilization (which reduce fuels) and fire exclusion continue to be practiced on sites invaded by juniper, tree density will continue to increase, and juniper will continue to expand onto shrub- and grass-dominated sites (Burkhardt and Tisdale 1976). An active management program that includes prescribed fire will reduce the amount of tree encroachment and maintain the character and productivity of the original plant community.

Prescribed burning can be an effective management tool in forested vegetative communities in the West. Fire reduces surface fuels on clearcuts as well as in the understories of fire resistant trees; to remove understory reproduction in ponderosa pine, Douglas fir, and western larch forests, which provide a fuel ladder to the overstory; to thin overstocked stands of trees; to prune lower branches from trees; to create seedbed; to reduce vegetative competition with naturally regenerated or planted conifers; to enhance forage values; to maintain and improve browse quality and quantity; and to rejuvenate old stands of deciduous trees.

If fires are excluded from forest types which historically had high frequencies of understory fire, the eventual result can be the weakening of the stand, an increase in activity of bark beetles, and an increase in the proportion of dead trees. Fuels and/or bug-killed trees lead to stand-destroying fires. Many acres in the West have had fire excluded for 50 to 75 years, and some fires in recent years are likely a result of the accumulation of fuels and insect activity.

Slash from thinning and selective logging can be burned to reduce fire hazard without harming the residual trees in these communities. Ponderosa pine is generally not clearcut, but clearcuts in Douglas fir and western larch are often burned to manage the fuels, prepare seedbed and planting spots, and manage competing plants. Without fire, ponderosa pine and Douglas fir sometimes invade grasslands, and prescribed fire can be used to eliminate these trees when they are young.

Prescribed fire can produce favorable conditions for conifers. Burning ponderosa pine forests increases grasses and top-kills shrubs, such as chokecherry, western serviceberry, and bitterbrush, which will sprout the next year. In general, fire is beneficial to grasses and forbs in ponderosa pine associations but not where shrub understories dominate (Wright and Bailey 1982). Burning of Douglas fir forests increases shrubs such as snowbush, ceanothus, western serviceberry, common snowberry, and sticky currant. In some Douglas fir areas, ponderosa pine and quaking aspen may become fire climax species. Although easily killed by surface fires, quaking aspens

quickly sprout from roots, making the tree a quick competitor in many Douglas fir and spruce fir forests.

The occurrence of fire in aspen stands has been reduced by fire suppression and by lack of understory fuels. The lack of understory herbaceous fuel caused by livestock grazing precludes the occurrence of fire in most aspen stands (Jones and DeByle 1985). Without fire, conifers invade many aspen stands, gradually eliminating the aspen, because aspen sucker replacement is often insufficient to replace overstory aspen mortality (Schier 1975). Aspen communities on sites not suited for conifer establishment may eventually be replaced by grasses and shrubs (Schier 1975). Suckering is prevented by the presence of mature trees as the trees and roots gradually deteriorate. Loss of aspen stands because of this phenomena has been observed in several Western States. A fire that occurs in an aspen stand that is still producing a few suckers, or in a mixed aspen conifer stand is likely to result in the rejuvenation of the aspen stand. The amount of postfire suckering is enhanced by warmer soil temperatures, which usually occur as a result of the blackened soil surface and reduced thickness of the litter and organic layer (Jones and DeByle 1985). As is true for rangeland sites, an aspen site must be rested from grazing until the community recovers to some degree (Brown and Simmerman 1985). Wildlife use can be regulated to some extent if a large enough burned area is selected, or if several areas in the same general vicinity are burned, thus dispersing use over a greater acreage.

The understories of ponderosa pine, Douglas fir and western larch communities are all adapted to fire. Some later successional species that may have established because of fire exclusion might not be favored, but the natural shrub, forb, and grass associates of these species would recover by sprouting or from seed stored in the forest soil organic layer (duff) after fire. The exact response varies by fire prescription, season, moisture condition, and plant species.

Slash burning potentially could do more harm to a site than prescribed underburning because of the presence of large amounts of slash on the soil surface. An objective for burning slash may be to kill some of the understory species so that less competition is present for trees that might be planted. Specific ranges of moisture content of large diameter fuels, duff, and soil can be selected for the fire prescription that will have the desired effect on understory vegetation, with consideration given to the effects of burning on the soil. One effect of this treatment, which is perhaps more closely associated with the removal of the forest overstory than of the burning itself, is that plants that require sunlight will do better after the treatment than those that require shade. This change in dominant species, or species present, would persist until the forest overstory

again develops to the point where it provides a good cover of shade.

Riparian Areas: networks of riparian zones include perennial and intermittent stream channels, springs, seeps, bogs, etc. Riparian zones may be defined as the area within the active stream channel and floodplain combined with an adjacent zone of interaction between the channel and vegetation (in forested systems, generally the height of one site-potential tree). Within these distinct riparian networks, vegetative communities, soil types, moisture regimes, and subsequently, fire frequency and susceptibility, may differ markedly from the surrounding stands.

Riparian communities occur throughout Montana and the Dakotas, although they make up the least extensive vegetation type, with less than one percent of the total area and less than one percent of public land. Because of their productivity and other values, they are critically important and have received continuous intensive use since presettlement times (Branson 1985).

The presence of water, the increase in humidity, and the modification of temperature within riparian areas allow upland vegetation to exist at lower elevations than normal; riparian-related blue spruce is an excellent example. Riparian zones are also much more complex than their adjacent uplands (Thomas et al. 1979), making them much more difficult to categorize.

Conclusion: In the long term, many wildland fires would burn hotter and be more severe with Alternative A because there would be more fuels to burn during the hot dry periods when wildland fires are most common. Important native grasses would be more susceptible to damage from more wildland fire during hot dry weather. Shrubs are even less tolerant of fire than grasses. The season and intensity of wildland fires with Alternative A would generally cause the effects on shrubs to also be more severe with Alternative A.

With Alternative B, the use of more prescribed fire to treat hazardous fuels buildup would decrease less desirable species while increasing more desirable species on category B and C management areas. Long-term site productivity would be maintained and enhanced on more B and C category sites. Alternative B would increase edge effect and plant diversity at these sites. Important native grasses would benefit from more spring and fall prescribed fires. Mortality of many shrub species would be reduced compared to Alternative A because there would be more prescribed burning to reduce hazardous fuels when soils are moist. The use of more mechanical treatments and prescribed fires to reduce fuels and bug-killed trees with the proposed fire management would gradually reduce the

potential and amount of stand-destroying wildland fires anticipated with Alternative A. Alternative B would result in more long-term improvements in overall forest health.

The treatments and cumulative effects on riparian areas would probably be about the same with both alternatives since the number and size of wildland fires and the use of prescribed fires would be similar.

Range Management: Burning of rangeland may temporarily reduce grass and forb production, thus reducing available forage for livestock. However, the burning of rangeland generally results in greater perennial grass production and grazing capacity as well as increased forage availability from the removal of physical obstructions to plants posed by dense stands of sagebrush or other brush species. Using prescribed burning in concern with herbicide treatments would effect the greatest positive response in situations involving brush land.

Some sagebrush communities are being invaded by juniper. Fire is a natural means by which the balance of these vegetative communities are maintained. Without disturbance such as fire, these communities tend to be invaded by woody species such as juniper. When this succession occurs, the amount of plant material that is available for grazing or browsing by domestic livestock or wildlife decreases.

Prescribed fires may be managed to increase the quality and quantity of forage. These fires create a balance of seral stages, open up more grassland parks, and reduce encroachment of juniper. Low to moderate intensity fires can have the objective to remove dense sagebrush stands and/or other species that herbaceous plants must compete with for sunlight, soil moisture, and nutrients. Prescribed fires also release nutrients back into the soil. The result is an "edge effect" and vigorous new plant growth which increase forage for grazing animals.

Burns can also improve range by distributing livestock and big game use. Fires help create a mosaic of vegetation that provides more palatable and nutritious forage. These burned area can also be effective in drawing cattle into uplands away from riparian areas.

However, since new growth that follows burns are favored by livestock and wildlife, there is the potential for excessive use which decreases plant vigor and increases erosion if grazing is not properly managed.

The immediate loss of forage and the effects of temporary use restrictions following fire would vary with the individual permittee, depending on the size of the area burned and the operator's flexibility in his/her operation.

Conclusion: The immediate loss of forage and the effects of temporary use restrictions following wildland fires would occur with both alternatives. The severity of the fire may be less and recovery may be faster if the wildland fire burns an area recently treated with prescribed fire.

In untreated areas, competition from woody species in many grassland and shrub areas would continue to suppress grasses and forbes. The invasion of junipers and pines into herbaceous vegetation would continue in these areas and the quality and quantity of forage available for livestock would decline. This is more likely to continue with Alternative A than with the proposed management (Alternative B).

Range management and grazing permittees should benefit in the long term by the proposed fire management (Alternative B) which would increase the number of prescribed fires that are managed for increased forage production and accessibility for livestock and big game. The increased use of prescribed fires to improve range condition and increase forage production would allow operators more flexibility to plan for short-term disruptions in livestock grazing use.

Air

In undeveloped areas, ambient pollutant levels should be near or below measurable limits. Locations near economic developments and population centers are most vulnerable to air quality impacts such as automobile exhaust, residential wood smoke, and industrial pollution. Noise levels are site-specific and vary continuously. Rural noise levels should average 30 to 50 decibels A-weighted (dbA), with occasional peak levels to 90 dbA.

National ambient air quality standards limit the amount of specific pollutants allowed in the atmosphere: carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter (total suspended particulates and inhalable particulates).

Through the Clean Air Act Amendments of 1977, Congress established a system for the Prevention of Significant Deterioration (PSD) of "attainment" and "unclassified" areas. Areas are classified by the additional amounts of nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and total suspended particulate (TSP) degradation that would be allowed. PSD Class I areas, predominantly National parks, Indian reservations, and certain Wilderness Areas, have the greatest limitations; virtually any degradation would be noticed. Areas where moderate controlled growth can take place have been designated as PSD Class II. PSD Class III areas allow the greatest degree of degradation.

PSD Class I regulations also address the potential for impacts to Air Quality Related Values (AQRVs). These AQRVs include visibility, odors, and impacts to flora, fauna, soils, water, and geologic and cultural structures. A possible source of impact to AQRVs is acid precipitation.

All BLM administered lands are classified PSD Class II. However several areas near BLM administered public lands are class I airsheds. These include Glacier National Park, Cabinet Mountain Wilderness, Flathead Indian Reservation, Mission Mountains Wilderness, Selway-Bitterroot Wilderness, Anaconda-Pintlar Wilderness, Gates of the Mountain Wilderness, Scapegoat Wilderness, Bob Marshall Wilderness, Medicine Lake National Wildlife Refuge, Fort Peck Indian Reservation, Fort Belknap Indian Reservation, U.L. Bend National Wildlife Refuge, Northern Cheyenne Indian Reservation, Yellowstone National Park, North Absaroka Wilderness, Washakie Wilderness, Red Rock Lakes Wilderness, Lostwood National Wildlife Refuge, Theodore Roosevelt National Park (North Unit, Elkhorn Ranch Unit, and South Unit), Wind Cave National Park, and Badlands National Park.

Areas that consistently violate federal standards because of human activities are classified as "non-attainment" areas and must implement a plan to reduce ambient concentrations below the maximum pollution standards. Non-attainment areas in Montana and the Dakotas include Great Falls, Columbia Falls, Flathead County (Whitefish and vicinity), Kalispell, Polson, Ronan, East Helena, Libby, Missoula, Lake Deer, Sanders County (Thompson Falls and vicinity), Butte, Billings, and Laurel.

Fires are a source of air pollutant emissions because of the combustion which burns various ages, sizes, and types of vegetation. The amount of emissions depends on the size and intensity of the fire, the fuel type and moisture content, and the available fuel loading. The most effective means of controlling air pollutant emissions from wildland fire is to inhibit large, catastrophic fires through vegetation treatments that break up heavy, continuous fuels. Depending on the conditions, managed natural fires and prescribed fires can be effective methods to reduce heavy fuels. When properly executed, managed fires are expected to result in fewer short-term and long-term air quality impacts. These managed fires are normally much smaller and involve less combustion since they occur when fuel type and fuel loading meet preset parameters for control and under weather conditions that enhance efficient fuel consumption and air pollutant dispersion. By reducing the risk of uncontrolled wildland fire, the risk of significant air quality impacts is also reduced.

Other impacts to air quality would include moderate increases in noise, dust, and combustion engine exhaust

generated by manual and mechanical treatment methods; and aerial application of retardant. Impacts would be temporary, small in scale, and quickly dispersed. These factors, combined with standard management practices (resource considerations included in Appendix A) minimize the significance of potential impacts. Federal, State, and local air quality regulations would not be violated.

Potential air quality impacts are assessed before project implementation. Site-specific plans are reviewed for compliance with applicable laws and policies, and existing air quality is inventoried so that changes associated with the BLM proposals may be determined. Additional mitigation may be incorporated into specific project proposals to further reduce potential impacts. For example, prescribed burning activities must comply with the BLM Manual, Sections 9211.31(E), Fire Planning, and 9214.33, Prescribed Fire Management, to minimize air quality impacts from resulting smoke. This procedure requires compliance with individual state and local smoke management programs that specify the conditions under which burning may be conducted.

Particulate matter and carbon monoxide are the primary pollutants emitted during prescribed burning that would affect air quality. Compliance with local smoke management programs would minimize these effects. The timing, vegetation type, size of burns, fuel arrangement and moisture, ignition techniques and patterns, and weather conditions are all specified to keep smoke amounts within acceptable limits. The actual level of impact depends on a combination of all these factors. Prescribed burning would generally occur under more favorable air conditions to meet air quality regulations since the exact timing and location of wildland fires cannot be controlled.

Potential cumulative impacts may occur when multiple fires occur simultaneously or if fires occur when other nonfire related activities are also contributing to air quality impacts. If conditions were such that the cumulative effects of human activities violated air quality standards in Class I airsheds, prescribed burns would not be allowed until conditions change and prescribed burns could occur without exceeding air quality standards.

Smoke impacts and smoke management of prescribed fires are coordinated regionally by the Montana/Idaho Executive Airshed Board with members from federal and state agencies and private industry.

Conclusion: Overall, air quality impacts would generally be greater with wildland fires than with prescribed fires since wildland fires burn more acres and are less likely to occur under favorable conditions. Since more wildland fire

are expected to burn more area and under less favorable conditions with Alternative A, air quality impacts are also expected to be greater even though Alternative B would have more prescribed fires. The severity of cumulative air quality impacts from multiple wildland fires that occur simultaneously and burn more acres and consume a greater proportion of fuel would be greater with Alternative A. Guidelines contained in Appendix A would also help reduce the impacts from the Proposed Action (Alternative B).

Soils

Soils are variable across Montana and the Dakotas and have different characteristics and different properties depending on such factors as climate, vegetation, and parent material. Soil types that occur on BLM lands are identified in most of the BLM Resource Management Plans.

Results from studies of wildland fires are difficult to interpret because of the widely varying environmental conditions under which they occur and the fact that these conditions are rarely documented.

Fireline construction exposes soils to accelerated soil loss, invasive species, reduced site productivity, concentrated overland flow, sediment delivery to streams, water quality degradation, and aquatic habitat problems. Without proper precautions, fueling sites and retardant drops may result in contamination of surface water, ground water, and soils. Soil and vegetation damage may result from the construction and use of new camp sites, staging areas, and helibases. Damming culverts for water sites can saturate road embankments and cause mass failure or force overbank diversion which can cause erosion. Excavating pools can cause stream destabilization and increased sedimentation. Constructing streamside engine access can damage riparian vegetation and soils.

Prescribed burning affects soils primarily by consuming litter; organic soil layers; down, dead, and woody fuels; and vegetative cover (Wright and Bailey 1982). Fire may alter soil chemical properties, nutrient availability, postfire soil temperature, microorganism populations and their activity rates, physical properties, wettability, and erosion. The degree to which these characteristics are affected in the short term depends on the ignition technique used; dead fuel, live fuel, organic layer, and soil moisture at the time of burning; thickness and packing of the litter layers; depth and duration of heat penetration into organic and soil layers, as well as maximum temperature attained at different depths within the profile; soil type; and soil texture.

Nutrient losses from the site and postfire erosion are closely related to topography, remaining plant cover, frequency and area of bare soils, and the timing and severity of postfire precipitation events with respect to postfire litterfall and vegetative recovery. A significant storm can wash ash from the surface, removing many of the nutrients released in the ash. Gentle rains can carry some of these nutrients into the soil profile. Many of the nutrients released in ash can be taken up by rapidly growing vegetation. Net nutrient losses caused by consumption of organic matter may be counterbalanced by increased availability of nutrients formerly locked in complex organic forms that cannot be used by plants. Activity of decomposing and nitrogen-fixing organisms may also change, further affecting the postfire nutrient balance.

Changes in soil chemical properties, including soil nutrients, caused by burning usually include an increase in soluble nitrogen, phosphorus, potassium, sulfur, magnesium, sodium, and calcium, and an increase in soil pH, which means a decrease in soil acidity (Fuller et al. 1955, Summerfield 1976). Carbon-nitrogen ratios are reduced because of the nitrogen increase and subsequent carbon decline caused by burning (Fuller et al. 1955). Losses of nitrogen and sulfur from mineral soils can occur as a result of volatilization, but conflicting results have been reported (Wright and Bailey 1982). Very severe (high-heat) fires usually result in net soil losses of nitrogen, calcium, and magnesium (Stark 1977, DeBano and Conrad 1978). Infiltration and percolation of water also may leach these nutrients in addition to raising the pH of the soil, altering soil chemistry, and changing ground-water and surface-water quality. Soil cation-exchange capacity also may decrease after severe burns (Wright and Bailey 1982).

The percentage of nitrifying bacteria in soil that are killed depends on the depth and duration of soil heating, which varies significantly among fires. This is true for any group of soil microorganisms. Microorganism populations decline immediately after a burn (Jurgensen et al. 1979) but can quickly recover to greater than preburn numbers (Wright and Bailey 1980). Nitrifying bacteria, however, are extremely sensitive to fire over wet and dry soil and do not recover quickly after a burn (Dunn and DeBano 1977). The threshold temperature level is lower in wet soil than in dry soil, and the amount of soil heating is generally regulated through the prescription in the prescribed fire plan. Heterotrophic bacteria respond to heating in a similar manner as nitrifying bacteria, but at higher temperatures (Dunn and DeBano 1977). Fungal responses to burning are not consistent (Ahlgren and Ahlgren 1965). However, when related to metabolic processes, microbial populations are not adversely affected by prescribed burning (Wright and Bollen 1961, Jorgensen and Hodges 1971, Summerfield 1976).

The effect of fire on soils is closely related to the burn severity and the heat pulse to the soil, which is the result of the combustion of all fuels during flaming, glowing, and smoldering combustion. Significant amounts of deep soil heating occur only if there is long-duration burning in thick organic layers or accumulations of dead woody debris. Moisture content of thick organic layers, large-diameter dead fuels, and soil are critical determinants of the depth of heat penetration because wet fuels do not burn and moist soils limit the depth of soil heating (Frandsen and Ryan 1986). There is a close relationship between fire line intensity (the rate of heat released per foot of fire line during flaming combustion) and flame length. However, there is little relationship between the heat released during flaming combustion and soil heating. Most of the heat from flames rises and does not heat the soil. A high intensity fire with long flame lengths will cause little soil heating except at the immediate surface if subsurface fuels and soils are moist.

Studies generally agree that prescribed burning causes no appreciable change in soil mineral fractions (Beaton 1959, Summerfield 1976), although the heat of very severe fires may render a soil structureless and alter porosity and infiltration rates (Ralston and Hatchell 1971). However, a fire this severe is not likely to be staged in the vegetation types under prescribed conditions. Measurable changes in aggregation and permeability in soil surface layers also have been reported (Scott and Burgy 1956). Soil aggregate stability is maintained by vegetation cover protection (Tate 1987).

Depending on the severity and duration of a fire, some moderately permeable soils may develop resistance to wetting through the distillation of organic compounds (Wells et al. 1979, Wright and Bailey 1982, Holechek et al. 1989). Water-repellent layers are most common in shrub communities on dry, sandy soils (DeBano et al. 1976), but also occur in forest soils (Zwolinski and Ehrenreich 1967).

Vegetative cover, in addition to supplying organic material to the soil, also provides a structural shield to the ground surface. Removal of vegetation and litter exposes mineral soil and subjects the surface to raindrop impact, increasing overland flow and subsequent soil loss (Wright and Bailey 1982, Holechek et al. 1989). Soil creep and debris flow also can occur after soil is exposed (Wright and Bailey 1982).

The most important factors determining whether significant amounts of postfire erosion will occur are the amount of residual vegetation and organic matter remaining, the rate and amount of vegetative recovery, the timing of the vegetative recovery with respect to season and severity of precipitation events, and slope. In forested sites, litterfall of scorched conifer needles can significantly

cover the soil. When planning a prescribed fire on erodible soils, these effects can be mitigated by prescribing the fuel and organic layer moisture, thus minimizing the amount of organic layer removal; timing the fire so that vegetative recovery begins soon after; and leaving unburned areas of vegetation.

A Streamside Management Zone (SMZ) should be maintained around riparian, streamside, lakeside, or wetland areas. SMZs are buffer zones extending a minimum of 50 feet from the edges of these waterbodies to provide a vegetation filter that will remove sediment before runoff reaches waterbodies. Wider SMZs should be maintained where necessary in areas of steep or highly erodible soils to aid in soil and streambank stabilization and decrease the amount of sediment that reaches waterbodies (Montana State University, 1991).

Most chemical and soils effects in sagebrush are limited to the areas beneath sagebrush plants where most of the litter has been consumed because these are the only areas where high enough temperatures are generated to cause heating of associated soils to any significant depth. The major concern when burning is the postfire possibility of wind and water erosion (Summerfield 1976). The likelihood of erosion increases with slope and the length of time that the area remains sparsely vegetated. Wind erosion of topsoil is likely on exposed areas. For this reason, treatment planning should consider the timing of the burn with regard to the growing period of native vegetation and the time when any planted species might germinate and grow, as well as the seasonal occurrence of high winds or major precipitation events. Most soils in the sagebrush-grass areas are derived from basalt, and soil texture varies from loamy to clayey, although extensive areas have soils derived from rhyolite, loess, lacustrine, alluvium and limestone (Wright et al. 1979).

In general, studies of prescribed burning on sagebrush sites indicate that organic matter, pH, and nitrogen may be increased in soil surface layers (Summerfield 1976), but Blaisdell (1953) reported no pH change after sagebrush-grass burning. Burning sagebrush and leaf mulch may produce water repellency in soils under sagebrush plants (Salik et al. 1973). Although burning while the soil and mulch are cool and damp will reduce or eliminate this potential (Salik et al. 1973), pure stands of sagebrush may burn extremely hot (Wright and Bailey 1982).

Soil properties affected by burning on juniper communities include reduced infiltration rates (Buckhouse and Gifford 1976a) and increased amounts of phosphorus, potassium, nitrogen, and carbon for the first year following debris pile burns (Gifford 1981). Overland flow from burned areas contained greater amounts of potassium and phosphorus

than from unburned areas (Buckhouse and Gifford 1976b). Broadcast burning of chained and/or manually cut juniper is the best way to manage the site to prevent rapid takeover by small residual surviving juniper.

Burning juniper slash piles may be detrimental in some situations because soils may be sterilized by the concentrated heat, resulting in nutrient losses and declines in watershed quality (Everett and Clary 1985); however, in some cases, burning may be the only safe way to remove the slash piles. Leaving juniper slash material in place, rather than concentrating slash in piles, will reduce the potential for adverse impacts to the soils caused by localization of soil heating beneath fuel piles, as well as limit additional soil compaction caused by machinery used to pile or windrow the debris. Slash material burned in this fashion also releases nutrients such as nitrogen and phosphorous to the soil for immediate seedling uptake. Prescribed burning of a site several years after trees are chained or manually cut increases the length of the effective treatment because it kills residual trees or newly established tree seedlings. Additionally, the burning of windrowed slash eliminates visual conflicts, reduces survival of young or rooted juniper trees, and may increase seeding survival and establishment by eliminating habitat for rodents and rabbits. Removal of shrubs and trees from juniper communities by fire generally does not affect erosion. The treatment of shrubs and trees in juniper communities by prescribed burning, in conjunction with good management practices, should not significantly affect the rate of soil erosion. Burning of chained or manually cut juniper three years post-treatment reduced the fire hazard and killed residual trees and new juniper seedlings in central Oregon and also resulted in decreased erosion because of the release of existing understory plants and establishment of new plants, which caused a significant increase in protective vegetative cover over the watershed in comparison to the unburned area (Lent 1989).

Burning in plains grassland communities is a common practice. The removal of litter and soil organic matter has similar effects on soil aggregation and infiltration. Excessive litter accumulations may reduce microorganism activity (Wright and Bailey 1982) and nitrification; nitrogen-fixation and ammonification are increased by pH and the increased concentration of electrolytes after burning. Soil losses after burning on grasslands should be minimal because the grassland sod root systems and rhizomes remain in place, thereby facilitating rapid vegetation recovery and limiting the possibility of erosion.

Severe (high-temperature) burns on dry sites may form a water-repellent layer in the soil (USDA 1988). This direct impact to soil infiltration rates typically is avoided with prescribed burns by the burn prescription (program

design), which evaluates the various parameters that control the burn conditions (fuel loading, fuel moisture content, and soil moisture conditions) and authorizes the burn to proceed only when field conditions are conducive for a successful and effective burn.

The effect of burning on forest soils is closely related to fire severities (temperatures). Burning consumes organic matter on top of the soil and may consume some of that in the soil surface (Fowells and Stephenson 1933), although prescribed burning can be conducted to minimize duff removal (Fuller et al. 1955) and heat penetration into soil. Organic matter reduction is correlated to the reduction in total nitrogen on the forest floor; however, nitrogen accumulation occurs in the 0-to-2-inch soil layer (Wells et al. 1979). Phosphorous, potassium, calcium, and magnesium may increase in the 0-to-2-inch layer of forest soils post-burn (Wells et al. 1979), although Cambell et al. (1977) reported lower potassium levels in soil of burned areas than in unburned control plots. Prescribed burning apparently does not alter soil microorganism populations to the extent that soil metabolic processes would be impaired (Jorgensen and Hodges 1971); rather, the increase of soil temperatures could enhance soil metabolic processes by causing increased rates of nutrient cycling and increased nitrogen availability because of greater activity of decomposing and nitrogen-fixing bacteria.

Severe burning generally occurs only when levels of moisture in fuel, duff, and soil are low. In most cases prescribed fire would not be done under these circumstances. The main influence of severe burning on forest soil physical properties is to decrease soil permeability to water; light burning only slightly affects the physical soil properties (Fuller et al. 1955). If consumption of heavy fuels such as forest slash occurs, fires may decrease soil aggregates and porosity and increase bulk density for up to four years (Holechek et al. 1989). Also, some forest soils may develop a temporary resistance to wetting (Holechek et al. 1989), on sites where soil heating was concentrated beneath burning accumulations of heavy fuels. Temporary increases in overland water flow and erosion may result where severe fires denude soil cover and change soil physical properties (Hendricks and Johnson undated, Holechek et al. 1989). The gravity-induced movement of soil particles, can increase after a fire, with the amount related to the steepness of slope, the amount of vegetative and organic cover remaining, and the rate of vegetation recovery. However, these effects can be mitigated on prescribed burns by burning forested areas under moisture regimes that ensure the maintenance of residual organic cover and/or result in fairly rapid vegetative recovery.

Conclusion: The number of acres burned by wildland fires, the intensity of these fires, and the acres needing

rehabilitation, would gradually decrease with Alternative B mostly on category B and C fire management zones. More equipment restriction and the use of "light-on-the-land" suppression practices to protect steep and fragile soils with Alternative B (see Appendix A) would also avoid or reduce impacts to soils. In the long-term, the effects on soils from wildland fire described above would be less with Alternative B than with Alternative A (No Action).

With Alternative B, the number and total acres treated with prescribed fires and the number of mechanical treatments and acres treated to reduce hazardous fuels would increase compared to Alternative A. Guidance provided for prescribed fires in Appendix A would help mitigate adverse impacts. Anticipated impacts described above from prescribed fires would eventually be offset by reduced impacts from wildland fires.

Water Quality and Quantity

By burning vegetation and ground litter, fires reduce or eliminate the vegetation cover that buffers precipitation before it hits the soil surface. As a result, burned sites have lower soil-water infiltration rates which results in increased surface runoff and decreased soil moisture available for plants. Increased runoff can stress the stability of receiving streams and the associated aquatic biota. The seasonal timing, size, duration, and intensity of the fire determine the magnitude of these impacts.

Intense wildland fires cause greater increases in water temperature, sedimentation, and turbidity in the water by burning off vegetative cover, exposing mineral soil, and promoting surface runoff. Accelerated erosion also increases with surface disturbing fire suppression activities such as the use of heavy equipment to blade fire lines and off road vehicle use. Sediment from accelerated soil erosion and elevated levels of nitrogen and phosphorous from ash are common in water after wildfires. Most water quality impacts related to wildland fire depend on the type of vegetation burned and how long the vegetation is depleted. Often these impacts are short term and conditions return to pre-fire levels once vegetation is re-established. Increases in water temperature are typically caused by removing overhead shading.

Prescribed fire may increase stream nutrients, storm flows, and sediment loads. In general, the amount of increase depends on fire severity. Slash burns may produce minor increases in concentrations of some nitrogen compounds and cations; however, drinking water standards should not be exceeded even by severe burns. Underburns and grassland burns would have no significant effect on nutrients. Moderate slash burns may increase storm flow

volumes and peaks to streams by reducing the water used by remaining vegetation. Severe burns would cause greater increases by exposing mineral soil and promoting surface runoff. Underburns and grassland burns would be light to moderate. Underburns would not affect water quality, and grassland burns would affect it for only a few weeks until grass regrows. These burns would not significantly affect stream flows.

Invading juniper often compete with understory vegetation and cause its decline or loss. Resulting bare soils are subject to erosion. These trees use much more moisture than shrubs, forbs, and grasses. Prescribed fire that removes trees results in increased water yield, rejuvenates springs, allows understory to recover, and provides more watershed protection.

In order to protect water quality and TES, Special Status, and sport fish habitat, a Streamside Management Zone (SMZ) should be maintained around riparian, streamside, lakeside, and wetland areas. This 50-foot (minimum) buffer zone helps preserve a variety of ecological processes by creating a vegetation filter that removes sediment before it reaches a waterbody. Properly maintained SMZs protect trout fry and other young fish; maintain water temperatures necessary for spawning; introduce insects and other fish food to the water from streamside vegetation; stabilize streambanks and floodplains; and protect bird habitat and wildlife travel corridors associated with riparian areas. To minimize erosion and the amount of sediment that reaches waterways, special care should be given to maintaining an SMZ of appropriate width.

Conclusion: There is a greater expectation of water quality and quantity impacts (increased water temperature, sedimentation, and turbidity) from Alternative A because of a greater long-term likelihood of severe wildland fire, especially on forest lands in areas of hazardous fuels buildup. Wildfires in these areas burn hotter and are more likely to also burn riparian areas that protect stream and ponds.

With Alternative B, the number and total acres treated with prescribed fires and the number of mechanical treatments and acres treated to reduce hazardous fuels would increase compared to Alternative A. Guidance provided for mechanical treatments and prescribed fires in Appendix A would help mitigate water quality and quantity impacts.

Fish and Wildlife

Aquatic species trout native to Western Montana (such as bull and westslope cutthroat trout) evolved in a dynamic environment. Wildfires, ranging from small under-burns to large, stand-replacing events, were a natural part of this

environment, as were the stochastic events such as landslides that commonly followed. This historic fire regime is characteristic of a "pulse" disturbance pattern, in which events occur at one time with no further direct effects to the environment. It is likely that drainage-scale extirpations of fishes followed large-scale, intense wildfires; however, regional populations were strong enough to provide individuals to quickly recolonize impacted areas.

Fish species most likely to be affected by the fires themselves are resident fishes of smaller streams: resident bull trout, westslope cutthroat trout, and sculpins. Resident fishes are entirely dependent on available habitat and stochastic events such as fires have been identified as a threat to these small, resident populations (Rieman and Macintyre 1993). In contrast, migratory fishes with access to larger streams (such as fluvial bull and westslope cutthroat trout) are more resilient to these environmental effects.

The disturbance cycles under which fishes evolved have changed substantially. Current patterns could be better described as a chronic or "press" pattern, with continual, direct effects to the aquatic environment and associated fish species. As a result, the capacity of fishes to withstand both the direct and indirect effects of wildfire has substantially diminished. Fishes already physiologically stressed are substantially less able to survive the additional increases in water temperature, inputs of fine sediments, or changes to hydrologic regimes that may follow wildfires. Furthermore, populations of native fishes are substantially reduced from historic levels, resulting in fewer "expendable" individuals and less fishes available to replenish populations elsewhere. Re-colonization may also be hampered by barriers to migration, including culverts, roads, and dams.

Thus, although wildfire and its direct and indirect effects are natural factors in aquatic and riparian ecosystems, the diminished physiological capacity of regional fishes, lack of available refugia, and low numbers of individuals available for post-fire re-colonization of burned drainages warrants an extremely cautious approach to fire management within these sensitive areas.

Any change in the vegetation of a particular plant community is likely to affect the wildlife species associated with that community. Any change in community vegetation structure or composition is likely to be favorable to certain animal species and unfavorable to others (Maser and Thomas 1983). The key to understanding the effects of vegetation manipulation on wildlife involves an understanding of the vegetation structure, production, flowering, and fruiting of the community; these characteristics relate

to seasonal cover and food requirements for particular animal species and predators dependent on them. These characteristics also respond to a particular vegetation manipulation.

Plant communities on many western rangelands are no longer pristine and therefore do not support pristine populations of wildlife species. Many range land plant communities have herbaceous weeds or a higher ratio of woody to herbaceous perennial vegetation than under pristine conditions. These vegetation conditions may favor certain wildlife species, such as the chukar partridge which utilize cheatgrass for food (Weaver and Haskell 1967), or they may disfavor other species, such as the pronghorn antelope, which require mixed-plant communities, rather than those plant communities dominated by a few woody or herbaceous species (Yoakum 1975). In general, the greater the diversity of the plant community, the greater the diversity of the associated animal community (Gysel and Lyon 1980).

Therefore, any change in vegetation community structure or composition will affect resident fish and wildlife populations. The effects of fire on wildlife depend on the effects to vegetative structure, production, and phenology of the community. These characteristics relate to seasonal cover and food requirements for particular animal species-and the predators that depend on them. Effects on fish and wildlife from fire management depend on the timing, intensity, and vegetative species burned. Treatments that reduce runoff and sedimentation would benefit fish and aquatic wildlife. Treatments that cause shifts or changes in forage and habitat for wildlife, may have beneficial or negative effects, depending on the species.

Some prescribed fires have an objective of modifying some aspect of the vegetation for wildlife. These may change forage quality and quantity, intersperse new feeding areas with areas providing cover, and/or rejuvenate decadent browse plants. Changes in vegetation structure and dispersion of burned areas are key factors when planning prescribed fires for wildlife purposes.

Many different wildlife (vertebrate) responses to fires have been reported. Fire effects on wildlife vary with (1) animal species complex, (2) mosaic of habitat types, (3) size and shape of fire-created mosaic, (4) fire intensity, (5) fire duration, (6) fire frequency, (7) fire location, (8) fire shape, (9) fire extent, (10) season of burn, (11) rate of vegetation recovery, (12) species that recover, (13) change in vegetation structure, (14) fuels, (15) sites, and (16) soils. In addition, all the other factors that alter fire effects on vegetation and soils will influence wildlife responses to burning.

In general, fire affects wildlife by directly killing birds and animals, altering immediate post fire environments, and influencing postfire habitat succession (Lyon et al. 1978). Killing vertebrates by prescribed burning is rare (Lyon et al. 1978). For those species that cannot flee a burn, the most exposed habitat sites are dry, exposed slopes, hollow logs with a lot of exposed wood, burrows less than 5 inches deep, lower branches of trees and shrubs, and poorly insulated underground/ground nesting areas (Lawrence 1966, as cited by Peek 1986). Effects of prescribed burning on ground cover depends on fire severity: less severe fires on wet sites would remove less cover than more severe fires on dry sites. Escaped prescribed burns may accidentally destroy riparian habitats and impact aquatic resources, causing losses of wildlife through exposure, total loss of habitat, and through increased sedimentation of aquatic habitat caused by unchecked overland flow and destabilized stream channels.

Fire mainly affects wildlife through habitat alteration (Wright 1974a). Fire may create habitat diversity, by recreating lost or degraded habitats for indigenous species, and by allowing for the reintroduction of extirpated species when habitat degradation was significant to their extinction. Immediate postfire conditions raise light penetration and temperatures on and immediately above and below soil surfaces and can reduce soil moisture (Lyon et al. 1978). Burning of cover and destruction of trees, shrubs, and forage modify habitat structure (Lyon et al. 1978, Peek 1986). The loss of small ground cover and charring of larger branches and logs (with diameters greater than 3 inches) can affect small animals and birds. Early, vigorous vegetation growth immediately after a fire alters feeding and nesting behaviors (Lyon et al. 1978). Postfire plant and animal succession effects creating seral and climax mosaics in habitat cannot be generalized in their effects on wildlife (Lyon et al. 1978, Peek 1986). Impacts can be lessened if the period of treatment avoids the bird nesting season and other critical seasons when loss of cover would be critical to wildlife; for example, during critical reproductive periods and prior to severe winter weather conditions.

No significant changes in small mammal species were observed for one year postburn in sagebrush-grassland (Frenzel 1979, as cited by Starkey 1985), but shrews and other species with narrow niches require patches of unburned vegetation to sustain populations, although total small mammal numbers may not be altered (McGee 1982). Habitat changes induced by fire may temporarily decrease the number and diversity of small mammals in sagebrush vegetation (Klebenow and Beall 1977). By increasing habitat diversity, associated bird communities may be increased by burning (Starkey 1985). Low fire frequencies may be useful in maintaining productive habitat for sage

grouse (Peek 1986). Large intense fires affect other bird species, such as yellowthroat, yellow-breasted chat, Traill's fly-catcher, and yellow-billed cuckoo, because they require dense shrub cover (McAdoo and Klebenow 1978). Conversely, sparrow species require relatively less shrub cover (McAdoo and Klebenow 1978). Because chuckar partridge rely heavily on cheatgrass, fire could conceivably be used to improve the habitat for this species (Wright and Bailey 1982). Prescribed burning in these types also may improve the habitat for higher numbers of sheep, pronghorn antelope, and mule deer (Klebenow 1985). Fire suppression has favored the expansion of mule deer populations in some sagebrush areas because of the increased forage or cover (Crouch 1974). In areas of limited rainfall and forage production the thermal cover provided by sagebrush may be critical to deer and other wildlife survival (W. A. Molini, pers. comm. 1990). Big sagebrush is a valuable forage plant on critical deer winter range and should be protected from fire in these areas (Vallentine 1980).

While complete type conversion of juniper sites to grassland may reduce wildlife diversity, creating a mosaic of successional stages with prescribed burning can be beneficial to wildlife (Severson and Medina 1984). Spotty burning probably would favor the greatest diversity of rodent and bird species (Wright and Bailey 1982). Fire suppression has favored expansion of mule deer populations in some juniper areas because of the increased forage or cover. Deer and elk use of burned juniper areas depends on postfire successional stages (Stager and Klebenow 1987), because burning can eliminate some important deer browse species (McCulloch 1969). An important factor in the degree of use of burned juniper habitats by deer and elk is the interspersed of burned habitats, which provide food, and unburned sites, which provide thermal and hiding cover. Old growth juniper stands may offer unique and valuable wildlife habitats, adding to the variety within juniper stands. When planning site-specific treatments, it should be recommended that these old growth communities be left standing as islands and edge communities to the prescribed burning areas.

Fire can be used to improve some species of prairie wildlife. Dabbling ducks and sharp-tailed grouse production increased on burned grassland as compared to undisturbed grassland in North Dakota (Kirsch and Kruse 1972). Prescribed burning also improved upland plover production. Fires can be destructive to songbirds, which require shrubs for nesting (Renwald 1977). Periodic burning is desirable to maintain ideal prairie chicken habitat in tallgrass prairie, but burned areas may not be preferred habitat for sharp-tailed grouse for several years postfire (Wright and Bailey 1982).

According to Marco Restani (Evaluating Management Strategies to Improve Prairie Dog Habitat in Eastern Montana: A 10-Year Plan, Draft, 1999), "The role of fire in limiting or promoting prairie dog populations is unknown. Fire alters grassland habitat, primarily by reducing shrub cover (Samson and Knoph). Reduced shrub cover could enhance areas for prairie dogs (Player and Urness, 1982), but the loss of sagebrush habitat and the threat of exotic grass introduction appear to make fire an undesirable tool for prairie dog habitat management."

Fire effects on wildlife in coniferous forests depend on ecological relationships and animal habitat needs. Ground fires have little direct influence on tree squirrels and may even be favorable by perpetuating ponderosa pine communities (Wright and Bailey 1982). Ground squirrels initially decreased in burned ponderosa pine communities but increased later as early successional advances were made (Lowe et al. 1978). Fire would probably adversely affect chipmunks in those communities where drier conditions prevail, but they may increase postburn on more moist sites (Lowe et al. 1978, Wright and Bailey 1982). Total bird numbers increased initially after burning in ponderosa pine communities but fell to below prefire levels later, although some individual species responded in an opposite manner (Lowe et al. 1978).

In one study, both deer and elk decreased their use of areas immediately following a burn but quickly increased levels of use as compared to control plots. Benefits to deer and elk from fires in these types are generally related to increases in understory vegetation (Leege and Hickey 1971, Severson and Medina 1983). Burns in Douglas fir and ponderosa pine communities improved forage palatability to mule deer (Keay and Peek 1980). Prescribed fire also can improve winter forage for mountain sheep (Hobbs and Spoorwart 1984). Prescribed fire can be used to rejuvenate old aspen stands, increasing habitat for moose, elk, deer, ruffed grouse, and snowshoe hare, all of which depend on the forage or cover produced in a young aspen community (DeByle 1985).

Conclusion: At first, comparing Alternative A to Alternative B involves comparing effects of wildland fire on wildlife to the effects of prescribed burning on wildlife. While some vertebrates are killed directly by fire, it is rare to kill vertebrates by prescribed burns. The other major effects of fire on wildlife, altering immediate postfire environments and influencing postfire habitat succession, would be determined as rehabilitation with wildland fire but could be considered as part of prescribed burning activity. Additionally, Alternative B would involve the selective introduction of fire to certain habitats and could be avoided in areas or at times where fire is not desired (i.e. in the immediate vicinity of sage grouse leks during nesting

season). Eventually, implementation of prescribed fire (Alternative B) would reduce the likelihood of wildland fire and the associated impacts on wildlife.

Threatened, Endangered, and BLM Sensitive Species: The following tables (9 and 10) summarize the presence/absence of Threatened, Endangered, and BLM Sensitive species and/or their habitat. The tables also provide recommended guidance for minimizing effects of prescribed burning and other fuel reduction activities under Alternative B.

The range and habitat presence are summarized by Field Office in tables 9 and 10, which are represented by the following codes:

010-Billings	064-Havre
020-Miles City	070-Butte
030-North Dakota	090-Malta
040-South Dakota	092-Glasgow
050-Dillon	100-Missoula
060-Lewistown	

The tables also summarize appropriate fire suppression methods for the species present in each Field Office, as represented by the following coding:

Wildland Fire Suppression:

Specific guidance for minimizing effects:

- WF1 - Protect known locations of occupied habitat.
- WF2 - Avoid use of heavy equipment (bulldozers, engines) within 100 meters of occupied habitat except as necessary to protect reproductive sites (nests, dens, etc.).
- WF3 - Restrict the use of aerial retardant application within 100 meters of occupied habitat except as necessary to protect reproductive sites (nests, dens, etc.).
- WF4 - Restrict the placement of fire camps, fire staging areas, and helibase from within 1/4 mile of occupied habitat.
- WF5 - Use of motorized vehicles during mop-up activity in suitable or occupied habitat should be avoided.
- WF6 - Restrict helicopter bucket fills, engine/pumper fills, or other water access/uses from within 100 meter of unvegetated sand-pebble beaches or islands in freshwater and saline wetlands and shorelines and exposed beds of larger reservoirs and rivers.
- WF7 - Restrict the use of heavy equipment, fire retardant, or placement of fire camps, staging areas, and helibases from within any occupied drainage.

Rehabilitation: General - Rehabilitation plans shall be designed and associated NEPA documentation (environmental assessment) shall disclose how the proposed action

will maintain or improve the quantity and quality of suitable habitat for TES species.

Specific guidance for minimizing effects:

- RH1 - Timing of rehabilitation efforts shall avoid disturbance during the reproductive (nesting, denning) season of TES species (varies by species).
- RH2 - Avoid and protect all known nesting, roosting, denning, and spawning sites/structures and maintain adequate patch size of habitat around site/structure.
- RH3 - No rehabilitation activities shall be incurred within 100 meters of sensitive plant populations unless specifically designed to maintain or improve the existing population.
- RH4 - Use of non-native vegetative species shall be minimized.
- RH5 - Off road use of motorized vehicles in suitable or occupied habitat should be avoided.

Fuels Treatments (Prescribed Burning and Other Fuels Management):

General - Prescribed Burn/Fuels Reduction plans shall be designed and associated NEPA documentation (environmental assessment) shall disclose how the proposed action will maintain or improve the quantity and quality of suitable habitat for TES species.

Specific guidance for minimizing effects:

- FT1 - Timing of prescribed burning or other fuels treatment activities shall avoid disturbance during the reproductive season of TES species (varies by species).
- FT2 - Avoid and protect all known nesting, roosting, denning, and spawning sites/structures and maintain adequate patch size of habitat around site/structure.
- FT3 - No prescribed burning or other fuels treatment activities shall be incurred within 100 meters of sensitive plant populations unless specifically designed to maintain or improve the existing population.
- FT4 - Baseline information shall be collected pre-treatment on existing condition and post treatment monitoring shall be conducted to determine the effectiveness of project.
- FT5 - Avoid off road use of motorized vehicles during prescribed burn or other fuels treatment activities in suitable or occupied habitat.
- FT6 - Insure fire prescription or fuels treatments will not consume dominate (large) trees within 1 mile of known nests and roost sites.
- FT7 - Avoid and protect important use areas for individual species; i.e. travel corridors (grizzly, lynx, wolf), resting sites (forested riparian for grizzly), foraging areas (snowshoe hare habitat for lynx), rendezvous sites (wolves).

TABLE 9
FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES
AND SPECIES PROPOSED FOR LISTING

Species (Status) (E) Endangered (T) Threatened (P) Proposed	Field Offices/Stations In Range (R) and with Habitat Present (H)	Field Offices with documented occurrence	Guidance for fire suppression, rehabilitation, prescribed burning, and other fuel reduction efforts. See Appendix A.
Bald Eagle (E)	R - all H - all	MT- 010, 020,030,040, 050,064, 070, 092,100	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5, FT6
Least tern (interior population) (E)	R- MT 010, 020, 030, 040, 060, 064, 090, 092 H-MT 010, 020, 060, 064, 090,092	MT 030,040	WF5, RH5, FT4, FT5, If presence of the species is documented the following guidance will apply: WF1, WF2, WF3, WF4, WF5, WF6, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Mountain Plover (P)	R - all but MT 100 H - all but MT 100	MT 010, 020, 060, 064, 070, 090, 092	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Piping Plover (T)	R - MT 010, 020, 030, 040, 060, 064, 090, 092 H - MT 010, 020, 060, 064, 090, 092	MT 020	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Whooping Crane (E)	R - MT 010, 020, 030, 040,050,060, 064,090, 092 H - MT 010, 020, 050, 090, 092	MT 050	WF5, RH5, FT4, FT5, If presence of the species is documented the following guidance will apply: WF1, WF2, WF3, WF4, WF5, WF6, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Black-footed ferret (E)	R -MT 010, 020, 030, 040, 060, 064, 070,090, 092 H - MT 010, 020, 030, 040, 060, 064, 070, 090, 092	MT 040, 090	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Canada Lynx (T)	R - MT 010, 050, 060, 070, 100 H - MT 050, 060, 070, 100	MT 050, 070, 100	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5, FT7

TABLE 9 (continued)
FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES
AND SPECIES PROPOSED FOR LISTING

Species (Status) (E) Endangered (T) Threatened (P) Proposed	Field Offices/Stations In Range (R) and with Habitat Present (H)	Field Offices with documented occurrence	Guidance for fire suppression, rehabilitation, prescribed burning, and other fuel reduction efforts. See Appendix A.
Gray wolf (E)	R - MT 010, 050, 060, 064, 070, 100 H - MT 010, 050, 060, 064, 070, 100	MT 010, 050, 070, 100	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5, FT7
Grizzly Bear (E)	R - MT 010, 050, 060, 070, 100 H - MT 010,050,060,070, 100	MT 050, 060, 100	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5, FT7
Bull Trout (T)	R - MT 100 H - MT 100	MT 100	WF1, WF5, WF7, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Pallid Sturgeon (E)	R - MT 060, 064, 090, 092 H - MT 060, 064, 090, 092	MT 030, 040, 060, 064, 090, 092	WF1, WF5, WF7, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Ute Ladies'-tresses (T)	R - MT 050, 070, 100 H - MT 050, 070, 100	MT 050, 070	WF1, WF2, WF3, WF4, WF5, RH3, RH4, RH5, FT3, FT4, FT5
Water Howellia (T)	R - MT 100 H - MT 100	none	WF1, WF2, WF3, WF4, WF5, RH3, RH4, RH5, FT3, FT4, FT5
Western Prairie Fringed Orchid (T)	R - MT 040, 050 H - MT 040, 050	none	WF1, WF2, WF3, WF4, WF5, RH3, RH4, RH5, FT3, FT4, FT5

TABLE 10
BLM (MONTANA AND DAKOTAS) DESIGNATED SENSITIVE SPECIES

Species	Field Offices In Range (R) and with Habitat Present (H)	Field Offices With Documented Occurrence	Guidance for fire suppression, rehabilita- tion, prescribed burning, and other fuel reduction efforts. See Appendix A.
BIRDS			
Bairds sparrow	R - MT 010, 020, 030, 040, 050, 060, 064, 070, 090, 092 H - 010, 020, 030, 040, 060, 064, 070, 090, 092	MT 010, 020, 030, 040, 060, 064, 090, 092, 100	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Black-backed wood- pecker	R - MT 010, 020, 050, 060, 070, 100 H - same as above	MT 020, 050, 060, 070, 100	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5, FT6
Black Tern	R - all Habitat - all	MT 020, 030, 040, 050, 060, 064, 090, 092	WF1, WF2, WF3, WF4, WF5, WF6, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Boreal owl	R - MT 010, 050, 060, 070, 100 H - same as above	MT - 050, 060, 100	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5, FT6
Burrowing owl	R - all H - all	all	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Canvasback duck	R - all H - all	all	
Columbian sharp-tailed grouse	R - MT 050, 070, 100 H - same as above	MT 050, 070, 100	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Common loon	R - MT 020, 050, 060, 064, 070, 100 H - same as above	MT 020, 040, 050, 060, 064, 100	WF1, WF2, WF3, WF4, WF5 RH1, RH2, RH5, FT1, FT2, FT4, FT5
Dickcissel	R - MT 010, 020, 030, 040, 060, 064, 090, 092 H - same as above	MT 020, 040	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Ferruginous hawk	R - all H - all	all	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5 FT1, FT2, FT4, FT5, FT6

TABLE 10
BLM (MONTANA AND DAKOTAS) DESIGNATED SENSITIVE SPECIES

Species	Field Offices In Range (R) and with Habitat Present (H)	Field Offices With Documented Occurrence	Guidance for fire suppression, rehabilita- tion, prescribed burning, and other fuel reduction efforts. See Appendix A.
Flammulated owl	R - MT 010, 050, 060, 070, 100 H - same as above	MT 070, 100	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5 FT1, FT2, FT4, FT5, FT6
Great gray owl	R - MT 010, 050, 060, 070, 100 H - same as above	MT 050, 060, 070, 100	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5 FT1, FT2, FT4, FT5, FT6
Hairy woodpecker	R - all H - all	all	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5 FT1, FT2, FT4, FT5, FT6
Harlequin duck	R - MT 010, 050, 060, 070, 100 H - 050,070,100	MT 050	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
LeConte's sparrow	R - 010, 020, 030, 040, 060, 064, 090, 092 H - same as above	MT 020	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4
Loggerhead shrike	R - all H - all	all	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5 FT1, FT2, FT4, FT5
Long billed curlew	R - all H - all	all	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Northern goshawk	R - all H - 010, 020, 040, 050, 060, 090,	MT 020, 040, 050, 064	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5, FT6
Peregrine falcon	R - all H - MT 010, 020, 050, 060, 064, 070, 100	MT 020, 010, 050, 060, 070, 100	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5

TABLE 10
BLM (MONTANA AND DAKOTAS) DESIGNATED SENSITIVE SPECIES

Species	Field Offices In Range (R) and with Habitat Present (H)	Field Offices With Documented Occurrence	Guidance for fire suppression, rehabilita- tion, prescribed burning, and other fuel reduction efforts. See Appendix A.
Pileated woodpecker	R - H -	MT 050	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5, FT6
Sage grouse	R - all H - all	MT 010, 020, 030, 040, 060, 075, 070, 090, 092	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Sage sparrow	R - MT 010, 020, 050, 060, 064, 070, 090, 092 H - same as above	MT 020, 050	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Swainson's hawk	R - all H - all	all	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5 FT1, FT2, FT4, FT5, FT6
Three-toed woodpecker	R - MT 010 H - MT 010		WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5, FT6
Trumpeter swan	R - all H - all	MT 010, 020, 040, 050, 060, 064, 070, 100	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5, FT6
White-faced ibis	R - all H - all	MT 020, 050, 060, 062, 092	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
MAMMALS			
Black-tailed prairie dog	R - MT 010, 020, 030, 040, 050, 060, 064, 070, 090, 092 H - same as above	MT 010, 020, 030, 040, 060, 064, 070, 090, 092	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Fisher	R - MT 010, 050, 060, 070, 100 H - same as above	MT 060, 070, 100	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5

TABLE 10
BLM (MONTANA AND DAKOTAS) DESIGNATED SENSITIVE SPECIES

Species	Field Offices In Range (R) and with Habitat Present (H)	Field Offices With Documented Occurrence	Guidance for fire suppression, rehabilita- tion, prescribed burning, and other fuel reduction efforts. See Appendix A.
Meadow jumping mouse	R - MT 010, 020, 030, 040, H - MT 010, 020, 030, 040, 060, 064, 090, 092	MT 010, 020,	
Merriam's shrew	R - all H - MT 010, 020, 030, 040, 064, 070, 090, 092	MT 010, 020, 060, 064,	
North American wolverine	R - 010, 050, 060, 064, 070, 100 H - same as above	MT 010, 050, 060, 064, 070, 100	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Northern Bog Lemming	R - MT 050, 060, 070, 100 H - same as above	MT 050, 060, 100	
Preble's Shrew	R - all H - all	MT 010, 020, 060, 070,	
Pygmy rabbit	R - MT 050, 070, H - 050, 070,	MT 050	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Spotted bat	R - MT 010, 020, 050, H - MT 010, 020	MT 010	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Swift fox	R - MT 010, 020, 030, 040, 050, 060, 064, 070, 090, 092 H - same as above	MT 010, 020, 030, 040, 060, 064, 070, 090, 092	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Townsend's big-eared bat	R - all H - all	MT 010, 020, 040, 050, 060, 064, 070, 090,	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
Western spotted skunk	R - MT 010, 020, 040, 050, 070, 100 H - same as above	MT 010, 040, 050, 070, 100	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5
White-tailed prairie dog	R - MT 010 H - MT 010	MT 010	WF1, WF2, WF3, WF4, WF5, RH1, RH2, RH5, FT1, FT2, FT4, FT5

TABLE 10
BLM (MONTANA AND DAKOTAS) DESIGNATED SENSITIVE SPECIES

Species	Field Offices In Range (R) and with Habitat Present (H)	Field Offices With Documented Occurrence	Guidance for fire suppression, rehabilita- tion, prescribed burning, and other fuel reduction efforts. See Appendix A.
Woodland caribou	R - MT 100 H - MT 100	none	
REPTILES AND AMPHIBIANS			
Snapping turtle	R - all H - all	MT 010, 020, 040, 100	
Spiny softshell turtle	R - MT 010, 020, 050, 060, 064, 070, 090, 092, H - MT 010, 020	MT 010, 020, 060, 064,	
Canadian toad	R - 030, 060, 064, 090, 092 H - same as above	none	
Coeur d'Alene salamander	R - MT 050, 100 H - MT 050, 100	MT 050	
Spotted frog	R - MT 010, 050, 060, 064, 070, 100 H - same as above	MT 050	
Tailed frog	R - MT 050, 060, 064, 070, 090, 100 H - MT 050, 060, 070,	MT 050, 060, 070, 090, 100	
Wood frog	R - all H - all (except 050)	MT 040	
FISH			
Arctic grayling	R - MT 050, 070, 100 H - MT 050, 100	MT 050, 070	
Blue sucker	R- MT 090, 092 H- MT 090, 092	MT 020, 092	
Northern redbelly X Finescale dace	R-MT 092 H-MT 092	MT 020, 092	
Paddlefish	R - MT 010, 020, 030, 040, 064, 090, 092 H - MT 010, 020, 030, 040, 060, 064, 090, 092	MT 020, 040, 064, 090	
Pearl dace	R- MT 040 H- MT 040	MT 020, 040	

TABLE 10
BLM (MONTANA AND DAKOTAS) DESIGNATED SENSITIVE SPECIES

Species	Field Offices In Range (R) and with Habitat Present (H)	Field Offices With Documented Occurrence	Guidance for fire suppression, rehabilita- tion, prescribed burning, and other fuel reduction efforts. See Appendix A.
Shortnose gar	R - MT 030, 040, 090, 092, H - same as above	MT 020, 092	
Sicklefin chub	R - MT 090, 092 H - MT 090, 092	MT 040, 090, 092	
Sturgeon chub	R - MT 020, 060, 064, 090,092 H - same as above	MT 020, 040, 092	
Westslope cutthroat trout	R - MT 050, 060, 070, 100 H - same as above	MT 050, 060, 070, 100	
Yellowstone cutthroat trout	R - 010, 020 H - 010, 020, 050	MT 010,050	

Cultural Resources

The effect of prescribed burning on cultural resources depends on the location of the resource with respect to the ground surface, the proximity to fuels that could provide a source of heat, the material from which artifacts are made, and the temperature to which artifacts are exposed. Threshold temperatures for damage to cultural artifacts manufactured from different materials, such as ceramic or stone, vary significantly.

Surface or near-surface cultural materials may be damaged, destroyed, or remain essentially unaffected by prescribed burning, depending on the temperatures reached and the duration of exposure to that temperature. Wooden structures or wooden parts of stone structures are susceptible to fire. Combustible artifacts lying directly on the ground surface could be damaged or destroyed. The ability to date noncombustible surface artifacts may be adversely affected if exposed to specific high temperatures. Subsurface materials are usually affected by fire only where significant amounts of soil heating occur (where dry accumulations of dead woody fuel or duff layers are consumed). Prescribed fires in areas of cultural significance would not be ignited under conditions dry enough to cause significant subsurface heating. Subsurface

cultural resources are generally more subject to harm from construction of fire lines around planned fire boundaries than from the fire itself.

The heat, smoke, and soot from prescribed burning can also damage cultural resources, especially prehistoric rock art, by causing spalling which physically destroys the resource or by obscuring the surface of the resource with smoke and soot. Smoke and soot can damage cultural resources, by either increasing chemical deterioration or obscuring carvings and painted motifs.

Damage to cultural resources, prehistoric and historic, also results from fire suppression related activities. Often more damage is caused to cultural resources by blading fire lines, setting camps and staging areas, or using vehicles off road than by the fire.

Conclusion: Alternative B would provide more protection to cultural resources because more areas would be burned under controlled conditions where cultural inventories and mitigation would occur. This alternative also puts more restrictions on surface disturbance associated with fire suppression. See Appendix A. The acres of wildland fire and intensity of those fires would gradually decreased compared to Alternative A and cause less damage to

cultural resources. This would also result in less accelerated soil loss and exposure and damage to cultural sites.

Recreational and Visual Resources

Large severe wildland fires often change the landscape in a way that degrades visual quality and recreation opportunities and recreation experiences, especially on forest lands where the duration of impacts is also longer. The use of heavy equipment to blade fire lines and the use of staging areas, often leaves lasting visual scars that also degrade the visual quality and recreation experience. During periods of high fire danger and extensive wildland fire activity, such as in the summer of 2000, large areas of public lands may also be closed to the use of open fires or to any recreation use to protect public safety.

Since smoke from fires degrades air quality and visual quality, they also degrade recreational experiences at developed recreation sites and dispersed recreation. Visitation to burned areas would decline or cease altogether in the short term. The time period until recovery depends on the severity of the fire. In the long term, however, visitation could increase if the fire creates more of the "edge effect". The edge effect refers to the richness of flora and fauna occurring in a transition zone where two plant communities or successional stages meet and mix (USDA 1988).

Prescribed burning creates contrasting blackened areas and releases smoke into the air that temporarily impairs visibility. Burning does lessen the amount of logging debris that is seen and darkens the color of stumps and snags that, if not burned, would become more noticeable as they bleached over time. In the long term, prescribed burning might allow the regrowth of more aesthetically desirable vegetation.

Conclusion: Alternative B would provide more protection to cultural resources because there would be less intense and catastrophic wildland fires. This alternative also puts more restrictions on surface disturbance associated with fire suppression. See Appendix A. The acres of wildland fire and intensity of those fires would gradually decreased compared to Alternative A and cause less damage to visual quality and recreation resources.

Wilderness and Special Areas

Bear Trap Canyon (Lee Metcalf, 1983) is a 6,000 acre area included in the National Wilderness Preservation System. In addition, Montana BLM has 40 other areas totalling more than 452,500 acres that are Wilderness Study Areas (WSAs). All vegetation treatments in WSAs and

designated wilderness areas would be conducted to avoid impairing the wilderness characteristics of the area. Actions in WSAs are guided by the Interim Management Policy (IMP) until Congress makes a final wilderness decision. The guidance contained in Appendix A summarizes the Interim Management Policy concerning fire.

The BLM manual states that prescribed burning may not be used solely as vegetation treatment in wilderness areas. Prescribed burning may be used to maintain fire-dependent natural ecosystems and to reduce the risk of wildland fires. Prescribed burning could be beneficial in some areas, such as ponderosa pine forests or shrublands, where fire exclusion has affected the ecosystem's natural balance.

Conclusion: There would be very little difference of impacts on wilderness and wilderness values anticipated between the two alternatives. With Alternative B, there may be more of an awareness of the special considerations required for fire management of wilderness and WSAs.

Human Health and Safety

Smoke from fires will have a short-term impact on air quality. Individuals may experience eye, throat, or lung irritation from these exposures. People with asthma, allergies, and other breathing difficulties are likely to be especially sensitive to smoke from both wildland fires and from prescribed fires. Smoke would cause even greater breathing difficulty, eye irritations, sneezing, coughing, and other symptoms.

Possible effects on workers as a result of smoke exposure may include eye irritation, coughing, and shortness of breath.

Sociology

In 2000, the populations of Montana, North Dakota and South Dakota were each less than one million people, resulting in population densities of 6 people per square mile in Montana, 9 people per square mile in North Dakota and 10 people per square mile in South Dakota. Montana's 2000 population of 902,195 was a 13 percent increase over 1990. During the same time period South Dakota's population (754,844 in 2000) grew by nine percent and North Dakota's population (642,200 in 2000) grew by less than one percent.

The movement of people into some rural areas began in the 1970s and is expected to continue into the 21st century. In scenic areas, particularly those suited for recreation, lands are being developed for recreation uses or subdivided for homes and cabins. New rural subdivisions are appearing

across Montana and the Dakotas. In some cases, these subdivisions are adjacent to public lands. In 1999, BLM Field Offices completed a Wildland/Urban Interface Risk Questionnaire for areas adjacent to public lands. The results of the questionnaire indicate there are areas where medium to high potential for escaped fire, medium to high potential for loss of life or property and medium to high level of community support for dealing with fires.

The available attitude information on prescribed burns suffers from problems with definitions regarding the types of fires being assessed. The recently published "US Forest Service Communications Strategy: Prescribed Burning" summarizes the available attitudinal information this way: "...evidence exists suggesting the public and policy makers may not always understand or agree with the many issues surrounding prescribed burning. Direct and indirect research shows a pattern of growing public support of these policies; however, national surveys conducted since the Greater Yellowstone Ecosystem Fire of 1988 have demonstrated a lag between policy implementation and public acceptance.... In addition, public and policy maker support of prescribed burning is heavily influenced by issues relating to smoke and health; perceived degradation to ecosystem health; impacts of aesthetics, water and wildlife; and prescribed burns escaping control."

Since the Montana fires of 2000, additional attention and resources have been directed toward public attitudes regarding prescribed burns. Keeping apprised of and incorporating the evolving attitudinal information on prescribed burns can contribute to the success of these projects.

Conclusion: The movement of people into rural areas is expected to continue during the 21st century, which contributes to the emerging public opinion on prescribed burning on the public lands adjacent to rural/urban interface areas. Although not much attitudinal information is available on prescribed burns, there are some identifiable relationships between public opinion and the perceived image of prescribed burning. These issues include smoke impacts on health; the perceived effects of fire on the ecosystem; effects on aesthetics, water, and wildlife; and the possibility of prescribed burns escaping control and becoming wildfires. The public interest in hazardous fuels reduction generated by the fires of 2000 should contribute to an increased attention to public opinion regarding fires and prescribed burning, which will be useful in future projects and policies.

Relationship Between Short-term Uses and Long-term Productivity

Fire is a critical natural process that helps maintain healthy ecosystems and guards against natural disasters. While the total number of acres burned by wildland fire under either alternative may be essentially the same in the short term, eventually the severity of wildland fires will be reduced as Alternative B is implemented and hazardous fuels are reduced. Controlled fires on rangeland can promote seasonal growth of forage and a mosaic of wildlife habitats. Low-intensity fires in forest lands clear understory ladder fuels that could otherwise climb into tree tops and cause devastation. Prescribed fires conducted under specified conditions would eventually improve the health of the natural landscape and reduce the hazardous build-up of vegetation. Prescribed fires and other hazardous fuel reduction projects would help reduce the risk and devastation of raging wildland fire.

CONSULTATION AND COORDINATION

Public Notices, External and Internal Scoping

While BLM was trying to determine how best to approach a fire management update we consulted with other resource management agencies as well as our partners in fire suppressions efforts. We also conducted extensive internal scoping to determine how best to approach this. Contacts were identified at each Field Office and interdisciplinary team meetings were conducted at the Field Offices to identify preliminary issues and special areas of concern, to discuss appropriate methods of consultation and coordination, and to conduct preliminary discussions of alternatives and impacts. These efforts are summarized below.

Chronology of Consultation and Coordination Related to Fire Management Planning

1998

- | | |
|----------|---|
| January | Bleiker process for public participation initiated in each District Office. |
| March 18 | Letter sent to Northern Rockies Coordinating representatives explaining how we intended to approach fire management plan updates. |
| March 24 | Follow-up conference call with Northern Rockies Coordinating representatives to |

	discuss coordination with other agencies and the public.	Oct. 21	Letter from State Director sent to 115 other federal, state, and local agencies announcing the fire management planning process and offering to coordinate as appropriate.
April 7	Met with Bob Meuchel (FS regional fire planner) and Richard Hafanfeld to clarify concerns, answer questions, and gather information.	Oct. 30	Letter from Fire Management Officer sent to 48 fire wardens announcing the fire management planning process and asking for issues and concerns.
April 16	Met with Montana Department of Fish, Wildlife, and Parks (MDFW&P) to explain fire management plan updates.	Nov. 4	Briefed the BLM post fire conference on status of fire management planning.
April 20	ID Team meeting in Billings.	Dec. 2	Lewistown FO briefed Petroleum County Commissioners
April 27	ID Team meeting in Belle Fourche	Dec. 7	Lewistown FO briefed Chouteau County Commissioners
May 1-3	Attended Montana Fire Wardens annual meeting to meet with fire wardens and agency contacts from across Montana.	Dec. 8	Lewistown FO briefed Fergus County Commissioners
May 7	ID Team meeting in Butte (Butte/Missoula)	Dec. 15	Briefed the BLM State Management Team on status of fire management planning.
May 13-15	Attended Smoke Management Workshop sponsored by Western States Air Resource Council to discuss successful smoke management plans.	Dec. 15	Responses from letters and contacts include: general public (524), agencies (47), counties (1), fire wardens (17), and county commissioners (6).
May 18	Toured a prior prescribed burn and another planned burn with representatives of BLM, MDFW&P, DNRC (State Lands).	December	Lewistown FO sent letters, maps, and briefing statements to Hill County and Judith Basin County.
May 26	ID Team meeting in Dillon	1999	
May 28	ID Team meeting in Lewistown (Lewistown, Great Falls, Malta)	Jan. 12	Lewistown FO briefed Blaine County Commissioners
June 10	ID Team meeting in Miles City (Miles City, North Dakota)	Feb 24	Field Manager Tim Murphy was on a panel discussing "The Federal Wildland Fire Policy and the Eastern Montana Experience" at the Montana Association of Counties Mid-Winter Meeting in Helena MT.
Sept. 9	Briefed MT congressional staffs about fire management planning	March 10	Explained Montana approach for fire planning and NEPA compliance to BLM and other agency experts at the Fire and Resources-Implementing the Federal Wildland Fire Policy Workshop.
Sept	Federal Register Notice of Intent to prepare a NEPA document and possible RMP amendments related to fire management planning.	May 12	Provided an update on fire planning and NEPA compliance at the Spring Fire Operations Meeting.
Oct.	5067 letters from project leader sent to the general public announcing the fire management planning process and asking for issues, concerns, and a response from those who want to stay on mailing list.		
Oct.	Customized letters sent to County Commissioners from each Field Office Manager announcing fire management planning and offering to provide a briefing.		

Scoping Comments

In our letters and contacts with the public, agencies, and state and local officials we asked for comments and concerns by November 30, 1998. Comments from the public included concerns about fuels build-up and suggestions that the BLM have more timber sales, that the BLM should pay local fire departments to fight fires, that prescribed burns be used more often where there is fuels build-up and to control pine seedlings, that dams should be

fixed to provide a source of water to fight fires, that farmers and ranchers should be allowed to fight fires and that the BLM should provide more equipment. Prescribed fire was also described as a good management tool that should be used in managing the ecosystem.

County commissioners and fire wardens expressed general interest in fire management planning and specific interest in fuel build-up around Lead, South Dakota.

APPENDIX A

RESOURCE CONSIDERATIONS

The following resource objectives and guidance for wildland fire suppression, rehabilitation, prescribed burning, and other fuels management will be carefully considered under Alternative B for all Field Offices prior to fire management activities. These guidelines for fire related activities are intended to help protect the resources and values from wildland fire and, where feasible, to use fire-related activities to help meet the stated resource objectives. These guidelines are supplemented by Field Office specific guidance identified in later appendices.

Air Quality Objective: To protect air quality.

Wildland Fire Suppression and Rehabilitation:

The State Department of Environmental Quality will be notified of potential smoke effects resulting from a wildland fire being managed to achieve resource values. This will allow notification of potentially affected smoke-sensitive organizations, such as hospitals, schools, and retirement centers.

Prescribed Burning and Other Fuels Management:

Class I airsheds: Prescribed burning should not occur in a location or under conditions that would degrade Air Quality Related Values (AQRVs) in the following Air Quality Class I areas in and around Montana and the Dakotas: Glacier NP, Cabinet Mountain, Flathead, Mission Mountains, Selway-Bitterroot, Anaconda-Pintlar, Gates of the Mountain, Scapegoat, Bob Marshall, Medicine Lake, Fort Peck, U.L. Bend, Ft. Belknap Indian Reservation, Northern Cheyenne, Yellowstone NP, North Absaroka, Washakie, Red Rock Lakes, Lostwood, North Unit, Elkhorn Ranch Site, South Unit, Wind Cave, Badlands NM, or any other Air Quality Class I area. These AQRVs include visibility, odors, and impacts to flora, fauna, soils, water, and geologic and cultural structures.

Monitoring: Weather and smoke dispersion conditions should be monitored to assure air quality impacts remain within prescribed smoke management levels. If monitoring indicates conditions are no longer within prescription, the fire will be declared a wildfire and appropriate response strategy should be initiated.

Nonattainment areas: Prescribed burning should not occur in a location or under conditions that would degrade air quality in the following designated nonattainment areas in Montana or the Dakotas: Great Falls, Columbia Falls, Flathead County (Whitefish and vicinity), Kalispell,

Polson, Ronan, East Helena, Libby, Missoula, Lame Deer, Sanders County (Thompson Falls and vicinity), Butte, Great Falls, Billings, or the Laurel area.

Notification: Smoke sensitive entities (e.g. hospitals, schools, retirement centers, agencies, etc.) should be notified prior to and during prescribed fire activities. The public should be informed of the status of prescribed and managed fires, including smoke management contingencies, through the local press, radio, and television. Interagency Dispatch Office should be provided daily information on burning projects throughout the region.

Overnight burns: Prescribed burns should not continue overnight near Class I areas, near nonattainment areas, or near population centers to avoid greater impacts from smoke that result from air inversions.

Burn permits and other regulations: Prescribed fires require the approval from the Montana Department of Health and Environmental Science, Air Quality Bureau prior to initiating a burn. Prescribed fire will conform with the provisions of state regulations and implementation plans as specified in 9210-Fire Planning section of the BLM manual.

Cultural Resources Objective: To protect high value cultural resources from fire management related activities that could damage or destroy these cultural resources.

Wildland Fire Suppression and Rehabilitation:

Equipment Restrictions: Protect cultural and paleontological resources and values by restricting fire suppression to "light-on-the-land" fire suppression tactics in designated ACECs, archeological districts, and other designated high value cultural sites. Limit the use of heavy equipment and off road vehicles to existing roads and trails within these same areas during rehabilitation. Use of earth moving/tillage equipment would be prohibited for wildland fire suppression in areas with special designations to protect cultural resources and values, archeological districts, and other designated high value cultural areas and values unless waived by the Field Office Manager or an authorized officer. The aerial application of fire retardant would be restricted over areas that contain petroglyphs and pictographs. Priority for placement of fire camps and fire staging areas should be outside these special cultural areas. Use of motorized vehicles in these areas during mop-up should be minimized.

An intensive cultural resource inventory (Class III) should be completed where the surface has been disturbed by suppression activities (e.g., fire lines, fire camp areas, staging areas). Class III inventory will be completed in these areas before rehabilitation. Cultural resources discovered in or near disturbed areas will be protected from further damage during rehabilitation. A BLM resource advisor will be on site during suppression and rehabilitation activities to give guidance and ensure compliance with the guidelines and decisions established to protect cultural resource values.

Prescribed Burning and Other Fuels Management:

Cultural Inventories: To avoid damage to cultural resources and values, procedures adopted in IM No. 99-032 should be followed to meet requirements under the National Historic Preservation Act. Among other things this instruction memo specifies a class III inventory shall be conducted on all areas subject to surface disturbing activities.

ACEC areas: No prescribed burning should occur in or adjacent to designated historical or traditional religious ACECs without prior consultation with affected Native Americans or without appropriate inventory and safeguards consistent with IM-99-032.

Native American Consultation: Prior to implementing fire plans, the BLM will do an appropriate level of Native American consultation according to the guidance in BLM Manual 8160 and Handbook H-8160-1 to identify potential religious or cultural concerns.

OHV management guidance and restrictions listed under wildland fire suppression above will also apply to prescribed burning to protect cultural values. Priority for placement of fire camps and staging areas should be outside these special cultural areas. Use of motorized vehicles in these areas during mop-up should be minimized.

Fire management Objective: Use fire management treatments and activities where appropriate to help achieve other resource management objectives. Develop and implement an updated fire management plan for each Field Office. Identify high priority interface areas with a high risk of fire due to fuels buildup. Develop fuel management plans for these high risk areas.

Wildland Fire Suppression and Rehabilitation:

Train and use resource advisors and dispatchers to assist with prioritizing wildland fires during multiple ignition episodes and to work with Incident Commanders. Suppress

fires that occur in conditions outside of prescriptive parameters at minimum cost and size considering firefighter and public safety, benefits, and values to be protected, consistent with resource and fire management objectives. Rehabilitation will be based on careful consideration of resource objectives, area concerns, and constraints. All roads, trails and firebreaks constructed during wildland fire suppression activities will be restored to natural contours.

Seasonal fire closures: Identify areas where seasonal closures for open fires may be appropriate to reduce the risk of wildland fire on or adjacent to high value interface, commercial developments, recreation, wildlife, cultural, wilderness, and visual resource management areas and facilities. Emergency fire restrictions and closures may be implemented by the Field Office Manager during periods of high fire danger. Restrictions and closures will be closely coordinated with affected counties and cooperating agencies. The extent of fire restrictions will be determined by the Field Office Manager or an authorized officer in conjunction with counties and cooperating agencies. Emergency fire closures will be designed to reduce the risk of human-caused wildland fire on public lands. Special management areas may receive earlier or additional restrictions where necessary.

Prescribed Burning and Other Fuels Management:

Priority for prescribed burning and other fuels management activities will be given to lands identified as retention areas instead of lands identified as available for disposal. An interdisciplinary team (IDT) will analyze burn plans to identify appropriate guidance and mitigation.

Hazardous fuels reduction plans: Develop hazardous fuels reduction plans to reduce the risk of wildfire near urban population areas, rural subdivisions, communications sites, powerline and pipeline rights-of-way, and other facilities, commercial uses, and developments on or adjacent to public lands with hazardous fuels buildup. Identify areas where prescribed fire and other fuel management techniques may be used to reduce the fuels and risk of wildland fire on high value resource or commercial areas. Fuel reduction efforts will be coordinated with private landowners, affected interests, and other agencies.

Fish and Fish Habitat Objective: Protect high value fish habitat from fire management related activities that could harm fish or damage fish habitat.

Wildland Fire Suppression and Rehabilitation:

Streamside Management Zone (SMZ): The SMZ encompasses a strip at least 50 feet wide on each side of a

stream, lake, or other body of water, measured from the ordinary high water mark, and extends beyond the high water mark to include wetlands and areas that provide additional protection in zones with steep slopes or erosive soils. Management practices within the SMZ that might affect water quality, fish, or other aquatic resources may have to be modified. Limit the use of heavy equipment and apply "Light-on-the-Land" fire suppression techniques within the SMZ. Maintain vegetation within the SMZ to filter out sediment in runoff and decrease sedimentation and turbidity in fish habitat.

Threatened or Endangered (T&E) and Special Status species: "Light-on-the-land" fire suppression tactics will be used in designated areas that drain into threatened, endangered, or Special Status species fish habitat. The use of heavy equipment (bulldozers) during wildland fire suppression and rehabilitation in drainages with these fish species should be avoided to protect the fish species. Restrict the use of fire retardant from aerial application over or adjacent to identified sensitive, T&E species, and Special Status species fish habitat. Priority for placement of fire camps and fire staging areas should be outside these drainages. To minimize sedimentation and turbidity, use of motorized vehicles during mop-up should be minimized.

A fire plan for each drainage with T&E or Special Status fish species should specify fire management objectives and wildland fire suppression guidance taking into account the special concerns related to these fish species.

Wildland fire suppression in riparian areas, or areas that drain into sport fish species habitat or Special Status species fishery habitat (Yellowstone Cutthroat Trout) would limit the use of heavy equipment and restrict the use of fire retardant over or adjacent to identified Special Status species habitat.

Prescribed Burning and Other Fuels Management:

Streamside Management Zone (SMZ): SMZ guidance listed under wildland fire suppression above would also apply to prescribed fire practices.

Fuels management: Prescribed fire will remain a suitable distance away from fisheries, streams, lakes or ponds to minimize sediment that reaches the body of water. Distance will depend on vegetation cover and slope of the watershed. The use of heavy equipment should be avoided within designated watersheds to protect T&E and Sensitive Species fish habitat. Placement of staging areas and fire camps should be outside these watersheds. A prescribed burn plan should specify fire management objectives and consider existing watershed characteristics. Use of motorized equipment should be evaluated on a project basis to be "light-on-the-land" where appropriate.

Off Highway Vehicle (OHV) Use Objective: Vehicle use associated with non-emergency fire management on public lands should comply with existing travel restrictions to minimize damage to other resources, values, and authorized uses.

Wildland Fire Suppression and Rehabilitation:

Equipment use restriction: The use of heavy equipment and off-road vehicles for wildland fire suppression should be avoided in areas closed to OHV use except in emergency, administrative, or permitted situations. Where appropriate, resources and values should be protected by restricting fire suppression to "light-on-the-land" suppression tactics. In areas designated as limited OHV use, limit the use of earth moving/tillage equipment for wildland fire suppression to existing roads and trails unless waived by the Field Office Manager or an authorized officer. A Resource Advisor will be on site during fire suppression and rehabilitation efforts to provide guidance and insure compliance with these guidelines.

Prescribed Burning and Other Fuels Management:

Equipment use restriction: The use of heavy equipment and off road vehicles for prescribed fires should be avoided to protect resource values on areas designated as closed to OHV use. Placement of staging areas and fire camps should be approved by the Field Office Manager or Resource Advisor. "Light-on-the-land" techniques should be used on nearly all areas closed to OHVs. Where appropriate, the use of heavy equipment and OHVs shall require authorization on areas closed to OHV use and shall be limited to existing or designated roads and trails within areas designated for limited OHV use without authorization. The use of earth moving/tillage equipment for prescribed fires will be limited to existing roads and trails unless waived by the Field Office Manager or an authorized officer. Other uses of earth moving/tillage equipment will require authorization. A Resource Advisor will be on site during fire suppression and rehabilitation efforts. All prescribed fire activities will be done in a manner to avoid unnecessary impairment of the area's resources and values.

Recreation Objective: Protect developed recreation facilities and special recreation management areas.

Wildland Fire Suppression and Rehabilitation:

Seasonal fire closures: Identify areas where seasonal restrictions or closures may be appropriate to reduce the risk of wildland fire on or adjacent to high value recreation areas and facilities.

Prescribed Burning and Other Fuels Management:

Hazardous fuels reduction plans: Develop hazardous fuels reduction plans to reduce the risk of wildfire near designated recreation facilities on public lands. Identify areas where prescribed fire and other fuels management techniques could be used to reduce dangerous fuels buildup near important recreation facilities.

Rights-of-Way Objective: Protect powerlines, pipelines, communications sites, roadways and other permitted facilities on rights-of-way that could be damaged by fire management activities.

Wildland Fire Suppression and Rehabilitation:

Fire closures: Identify areas where seasonal restrictions or closures for open fires may be appropriate to reduce the risk of wildland fire on or adjacent to high value interface, commercial developments, recreation, wildlife, cultural, wilderness, visual resource management areas and facilities.

Prescribed Burning and Other Fuels Management:

Hazardous fuels reduction plans: Develop hazardous fuels reduction plans to reduce the risk of wildland fire near urban population areas, rural subdivisions, communications sites, powerline and pipeline rights-of-way, and other facilities, commercial uses, and developments on or adjacent to public lands with hazardous fuels buildup. Identify areas where prescribed fire and other fuel management techniques may be used to reduce the fuels and risk of wildland fire on or adjacent to high value resource or commercial areas.

Soil and Water Objective: Maintain and protect watershed values and prevent accelerated erosion caused by fire management activities.

Wildland Fire Suppression and Rehabilitation:

Fireline construction: Avoid fireline construction in SMZs, wetland areas and on highly erodible sites (fine-textured soils, especially on steep slopes, and unchanneled drainageways such as swales, draws, and ravines).

Equipment restrictions: Avoid the use of heavy equipment and OHVs on steep and fragile soils and in SMZs during and following fire suppression. Limit the use of heavy equipment to blade fire lines in watersheds where State of Montana sedimentation standards are exceeded. Avoid the use of retardant over or adjacent to rivers, streams, and open water.

Light-on-the-land: "Light-on-the-land" fire suppression tactics should be used in SMZs and on steep and fragile soils and in designated watersheds with stream segments where sedimentation exceeds state standards. The use of heavy equipment (bulldozers) during wildland fire suppression and rehabilitation on these areas should be avoided. Fire camps should be located outside SMZs, fragile soils, and sensitive watersheds. Use of motorized vehicles and mechanical equipment during mop-up should be minimized within designated watersheds.

Fueling sites: Spill kits and barriers should be used at all fueling sites.

Watering sites: Do not dam culvert inlets for water supplies- outlets often have pools or can be dammed with less potential for impact. Do not excavate streams for watering pools. Use porta-tanks, pumps, and hose to bring water to an engine access spot rather than constructing access to streamsides.

Camps, staging sites, helibases, etc.: Use existing disturbed sites where soils are already exposed when feasible.

Soil stabilization: Fire rehabilitation plans should address the feasibility of soil stabilization and seeding to protect watersheds. Fires in watersheds where sedimentation in stream segments exceed state standards would receive priority for rehabilitation. Don't seed lightly burned areas. Seed perennial native species in moderate to severely burned areas. A short-lived annual cover species may be used in all burn severity areas to prevent short-term soil loss.

Fireline rehabilitation: Construct waterbars on all firelines except for those with rocky, well-drained soils. Shape exposed soils on dozer lines to original contour and seed with appropriate seed mix.

Runoff and erosion control and rehabilitation: Use rehabilitation practices listed in the Interagency Burned Area Stabilization and Rehabilitation Handbook.

Prescribed Burning and Other Fuels Management:

Areas will be burned to leave a mosaic pattern of unburned vegetation. Land uses will be monitored and adjusted as necessary after prescribed fire to sustain stable soils and vegetation. Vegetation will be re-seeded where needed.

Fragile soils: Avoid the use of heavy equipment and vehicles on fragile soils and in SMZs during prescribed fires and other fuels management activities. Removal of vegetative cover on fragile soils should be carefully examined in environmental analyses.

Fuels management: Place staging areas and fire camps outside of SMZs and designated watersheds with fragile soils. Use of motorized equipment would be limited to "light-on-the-land" techniques in designated drainages and watersheds.

Social and Economic Objectives: Reduce the risk of wildland fire on high priority interface areas.

Prescribed Burning and Other Fuels Management:

Develop and implement fuel management plans for interface areas at highest risk.

Special Areas Objectives: Protect Areas of Critical Environmental Concern (ACECs), Wild and Scenic River (W&SR) corridors, Outstanding Natural Areas (ONAs), Special Recreation Management Areas (SRMAs), and historic sites from surface disturbing fire management related activities.

Wildland Fire Suppression and Rehabilitation:

Equipment restrictions: Restrict the use of heavy equipment for wildland fire suppression in designated special areas.

Prescribed Burning and Other Fuels Management:

Fuel reduction plans: Develop hazardous fuels reduction plans to reduce the risk of wildfire on or adjacent to areas with special designations where public lands have hazardous fuels buildup. Identify areas where prescribed fire and other fuel management techniques may be used to reduce the fuels and risk of wildland fire on high value resource or uses.

Threatened, Endangered, and Sensitive (TES) Species and TES Habitat Objectives: Protect, maintain, and/or improve habitats necessary for the conservation of TES species and the ecosystems upon which they depend. Protect areas of occupied habitat and areas of suitable habitat, important for species expansion, from adverse effects resulting from fire/fuels management related activities. Maintain or improve quantity and quality of suitable habitat for TES species through the use of fire and fuels management and rehabilitation activities. The following guidance is recommended to minimize effects from fire suppression, rehabilitation, prescribed burning, other fuel reduction efforts and related activities. Refer to Tables 5,9, and 10 for a list of the guidance that applies to each species.

General-Use "light-on-the-land" fire suppression tactics wherever possible.

Specific guidance for minimizing effects:

BALD EAGLE:

BE1- Protect known nesting and roosting habitat. No human disturbance within 1 mile of bald eagle nests for the period of February 1 through August 15. No human disturbance within 1/4 mile of a winter roost (no winter roosts are currently identified on BLM managed lands).

BE2- Minimize disturbance to known winter roost sites: No human disturbance within 1 mile of a winter roost or if within 1 mile, activity is restricted to period of 9 am to 3 pm during the period of November 1 through March 1 (no winter roosts are currently identified on BLM managed lands).

BE3- Minimize risk to nesting and roosting sites: No blasting within one mile of bald eagle nest sites for the period of January 1 through August 15 and no blasting within one mile of bald eagle winter roost during the period of November 1 through March 1 (no winter roosts are currently identified on BLM managed lands).

BE4- No helicopter/aircraft activity or aerial retardant application within 1 mile of bald eagle nest sites for the period of January 1 through August 15 and winter roost sites for the period of January 1 through August 15.

BE5- Prescribed burn activities shall be conducted in a manner so as to insure nest and winter roost sites are more than 1 mile from downwind smoke effects.

INTERIOR LEAST TERN

Minimize disturbance, displacement, and risk to known nesting sites:

LT1 - No human disturbance within 1/4 mile of least tern nest sites for the period of May 15 - August 15.

LT2 - No blasting within 1 mile of least tern nest sites for the period of May 15 - August 15.

LT3 - No helicopter/aircraft activity or aerial retardant application within 1 mile of least tern nest sites for the period of May 15 - August 15.

LT4 - Prescribed burn activities shall be conducted in a manner so as to insure least tern nest sites are greater than 1 mile from downwind smoke effects for the period of May 15 - August 15.

MOUNTAIN PLOVER

Minimize disturbance, displacement, and risk to known nesting sites:

MP1 - No human disturbance within 1/4 mile of mountain plover nest sites for the period of April 1 - July 31.

MP2 - No blasting within 1 mile of mountain plover nest sites for the period of April 1 - July 31.

MP3 - No helicopter/aircraft activity or aerial retardant application within 1/4 mile of mountain plover nest sites for the period of April 1 - July 31.

MP4 - Prescribed burn activities shall be conducted in a manner so as to insure mountain plover nest sites are greater than 1/4 mile from downwind smoke effects for the period of April 1 - July 31.

PIPING PLOVER

Minimize disturbance, displacement, and risk to known nesting sites:

PP1 - No human disturbance within 1/4 mile of piping plover nest sites for the period of April 15 - July 31.

PP2 - No blasting within 1 mile of piping plover nest sites for the period of April 15 - July 31.

PP3 - No helicopter/aircraft activity or aerial retardant application within 1/4 mile of piping plover nest sites for the period of April 15 - July 31.

PP4 - Prescribed burn activities shall be conducted in a manner so as to insure piping plover nest sites are greater than 1/4 mile from downwind smoke effects for the period of April 15 - July 31.

WHOOING CRANE

Minimize disturbance, displacement, and risk to potential or occupied nesting sites:

WC1 - No human disturbance for the period of April 1 - August 31 within 1/4 mile of occupied whooping crane habitat (nesting, roosting, and foraging) or potential nesting habitat where whooping crane(s) have been observed within the past three years.

WC2 - No blasting for the period of April 1 - August 31 within one mile of occupied whooping crane habitat (nesting, roosting, and foraging) or potential nesting habitat where whooping crane(s) have been observed within the past three years.

WC3 - No helicopter/aircraft activity or aerial retardant application for the period of April 1 - August 31 within 1/4 mile of occupied whooping crane habitat (nesting, roosting, and foraging) or potential nesting habitat where whooping crane(s) have been observed within the past three years.

WC4 - Prescribed burn activities shall be conducted in a manner so as to insure whooping crane nest sites or occupied habitat are greater than 1/4 mile from downwind smoke effects for the period of April 1 - August 31.

BLACK-FOOTED FERRET

Minimize potential for disturbance, displacement/ mortality risk

BF1 - No heavy equipment operation off of existing roads within 1/4 mile of prairie dog town(s) having documented occurrence of black-footed ferret.

BF2 - No aerial retardant application within 1/4 mile of prairie dog town(s) having documented occurrence of black-footed ferret.

BF3 - No surface disturbance of prairie dog towns having documented occurrence of black-footed ferret.

CANADA LYNX

Minimize potential for disturbance, displacement/ mortality risk

CL1 - Activities shall not cause a greater than 30% temporary loss or 15% permanent loss of suitable habitat in a decade. In addition, 10% of the Lynx Assessment Unit (LAU) shall remain in denning habitat in patches larger than 5 acres.

CL2 - Processes used to reduce fuel levels, prepare sites for planting or for reintroduction of fire shall preserve the majority of large standing dead trees and large woody debris (denning habitat).

CL3 - Precommercial thinning or introduction of fire into lynx habitat shall only occur when the forest stand no longer provides snowshoe hare habitat. This occurs when self-pruning processes have eliminated snowshoe hare cover and forage availability.

CL4 - Following disturbance such as blowdown, fire, insects, and disease that could contribute to lynx habitat, do not salvage harvest when the affected area is smaller than 5 acres (exceptions would include areas such as developed campgrounds). Where larger areas are affected, retain a minimum of 10% of the affected area per LAU in patches of at least 5 acres.

CL5 - Design burn prescriptions to regenerate or create snowshoe hare habitat (e.g., regeneration of aspen and lodgepole pine).

CL6 - Minimize construction of temporary roads, firebreaks, machine lines, etc. on ridges, saddles, or areas that would create permanent travel ways that

could facilitate increased access by competitors (e.g., coyote, bobcat).

CL7 - Restrict livestock grazing of fire created openings, aspen stands, willow carrs, and other potential lynx habitat until successful regeneration of shrub and tree components occurs.

GRAY WOLF

Minimize potential for disturbance, displacement/mortality risk

GW1 - No human disturbance or associated activities shall be within one mile of a den site from April 15 to June 30.

GW2 - No human disturbance or associated activities shall be within one mile of a rendezvous site from April 15 to June 30.

GRIZZLY BEAR

Minimize potential for displacement/mortality risk

GB1 - Within the Recovery Zone (defined in Grizzly Bear Recovery Plan (USFWS 1993)) any off-road vehicular travel or vehicular travel on restricted roads, shall adhere to access standards/direction as provided in local or regional interagency agreements, Biological Opinions, or local Land Use Plans.

GB2 - All activities requiring overnight stays or establishment of a base camp shall be limited to less than 20 individuals and less than 5 days duration within the Recovery Zone (defined in Grizzly Bear Recovery Plan (USFWS 1993)).

GB3 - Firewood collection within the Recovery Zone (defined in Grizzly Bear Recovery Plan (USFWS 1993)) shall be limited to roadside hazard tree removal, road maintenance, or campground maintenance activities.

GB4 - Activities within the Recovery Zone (defined in Grizzly Bear Recovery Plan (USFWS 1993)) in Riparian, Meadows, and Stream Corridors including restoration & improvement projects must not occur between April 1 and July 1 or must be completed in 1 day.

GB5 - Within the Recovery Zone (defined in Grizzly Bear Recovery Plan (USFWS 1993)) projects that would significantly change the vegetative community shall not be implemented in huckleberry producing sites.

Minimize potential for habituation/human conflict

GB6 - Within the Recovery Zone (defined in Grizzly

Bear Recovery Plan (USFWS 1993)) activities will adhere to Interagency Grizzly Bear Guidelines or local interagency grizzly bear standards for sanitation measures and storage of potential attractants.

GB7 - Within the Recovery Zone (defined in Grizzly Bear Recovery Plan (USFWS 1993)) activities will not involve planting or seeding of highly palatable forage species near roads or facilities used by humans.

BULL TROUT

BT1 - Projects shall be designed using the guidance set forth in the "Interim Bull Trout Habitat Conservation Strategy".

PALLID STURGEON

PS1 - No aerial retardant application within 300 feet of Missouri or Yellowstone River.

PS2 - Restrict livestock grazing of riparian vegetation, especially cottonwood stands, recently affected by fire or other catastrophic events (blowdown, ice shear, flood, etc.) until successful regeneration of vegetative components occurs.

UTE LADIES' TRESSES

UL1 - All proposed action areas within potential habitat shall be surveyed by a botanically qualified biologist, botanist or ecologist to determine the presence/absence of the species.

UL2 - If surveys are not completed to determine the presence or absence of the species **no action**, that would potentially affect the species should it be present, will be implemented within suitable habitat.

UL3 - Areas of occupied habitat within a proposed project area will have a "site specific" **no activity** buffer established by a qualified botanist, biologist or ecologist, to protect occupied habitat.

UL4 - Apply Best Management Practices for protection of the project area from invasive plant species.

UL5 - Non-native species shall not be used in revegetation of suitable habitat.

WATER HOWELLIA

WH1 - All proposed action areas within potential habitat shall be surveyed by a botanically qualified biologist, botanist or ecologist to determine the presence/absence of the species.

WH2 - If surveys are not completed to determine the presence or absence of the species **no action**, that

would potentially affect the species should it be present, will be implemented within suitable habitat.

WH3 - Areas of occupied habitat within a proposed project area will have a "site specific" **no activity** buffer established by a qualified botanist, biologist or ecologist, to protect occupied habitat.

WH4 - Apply Best Management Practices for protection of the project area from invasive plant species.

WH5 - Non-native species shall not be used in revegetation of suitable habitat.

WESTERN PRAIRIE FRINGED ORCHID

WP1 - All proposed action areas within potential habitat shall be surveyed by a botanically qualified biologist, botanist or ecologist to determine the presence/absence of the species.

WP2 - If surveys are not completed to determine the presence or absence of the species **no action**, that would potentially affect the species should it be present, will be implemented within suitable habitat.

WP3 - Areas of occupied habitat within a proposed project area will have a "site specific" **no activity** buffer established by a qualified botanist, biologist or ecologist, to protect occupied habitat.

WP4 - Apply Best Management Practices for protection of the project area from invasive plant species.

WP5 - Non-native species shall not be used in revegetation of suitable habitat.

Wildland Fire Suppression:

General - Use "Light-on-the-Land" fire suppression tactics in areas that include TES Species habitat.

Specific guidance for minimizing effects:

- WF1 - Protect known locations of occupied habitat.
- WF2 - Avoid use of heavy equipment (bulldozers, engines) within 100 meters of occupied habitat except as necessary to protect reproductive sites (nests, dens, etc.).
- WF3 - Restrict the use of aerial retardant application within 100 meters of occupied habitat except as necessary to protect reproductive sites (nests, dens, etc.).
- WF4 - Restrict the placement of fire camps, fire

staging areas, and helibase from within 1/4 mile of occupied habitat.

WF5 - Use of motorized vehicles during mop-up activity in suitable or occupied habitat should be avoided.

WF6 - Restrict helicopter bucket fills, engine/pumper fills, or other water access/uses from within 100 meter of unvegetated sand-pebble beaches or islands in freshwater and saline wetlands and shorelines and exposed beds of larger reservoirs and rivers.

WF7 - Restrict the use of heavy equipment, fire retardant, or placement of fire camps, staging areas, and helibases from within any occupied drainage.

Rehabilitation: General - Rehabilitation plans shall be designed and associated NEPA documentation (environmental assessment) shall disclose how the proposed action will maintain or improve the quantity and quality of suitable habitat for TES species.

Specific guidance for minimizing effects:

- RH1 - Timing of rehabilitation efforts shall avoid disturbance during the reproductive (nesting, denning) season of TES species (varies by species).
- RH2 - Avoid and protect all known nesting, roosting, denning, and spawning sites/structures and maintain adequate patch size of habitat around site/structure.
- RH3 - No rehabilitation activities shall be incurred within 100 meters of sensitive plant populations unless specifically designed to maintain or improve the existing population.
- RH4 - Use of non-native vegetative species shall be minimized.
- RH5 - Off road use of motorized vehicles in suitable or occupied habitat should be avoided.

Fuels Treatments (Prescribed Burning and Other Fuels Management):

General - Prescribed Burn/Fuels Reduction plans shall be designed and associated NEPA documentation (environmental assessment) shall disclose how the proposed action will maintain or improve the quantity and quality of suitable habitat for TES species.

Specific guidance for minimizing effects:

- FT1 - Timing of prescribed burning or other fuels treatment activities shall avoid disturbance during the reproductive season of TES species (varies by species).
- FT2 - Avoid and protect all known nesting, roosting, denning, and spawning sites/structures and maintain adequate patch size of habitat around site/structure.

FT3 - No prescribed burning or other fuels treatment activities shall be incurred within 100 meters of sensitive plant populations unless specifically designed to maintain or improve the existing population. **FT4 -** Baseline information shall be collected pre-treatment on existing condition and post treatment monitoring shall be conducted to determine the effectiveness of project.

FT5 - Avoid off road use of motorized vehicles during prescribed burn or other fuels treatment activities in suitable or occupied habitat.

FT6 - Insure fire prescription or fuels treatments will not consume (dominate) large trees within 1 mile of known nests and roost sites.

FT7 - Avoid and protect important use areas for individual species; i.e. travel corridors (grizzly, lynx, wolf), resting sites (forested riparian for grizzly), foraging areas (snowshoe hare habitat for lynx), rendezvous sites (wolves).

Vegetation Objective: Manage forest, shrublands, rangelands, riparian areas, and wetlands for proper functioning condition. Maintain or promote adequate amounts of vegetative ground cover; maintain, improve or restore riparian-wetland functions; promote the opportunity for seedling establishment; emphasize native species in the support of ecological function; and only use non-native species when native species are not available or are incapable of achieving proper functioning condition. Actively manage forest communities towards their historic range of variation (HRV). The land will be managed to meet Standards of Health as established in August 1997. Actions through all aspects of fire suppression, rehabilitation and subsequent use authorizations should be regulated to encourage recovery of native grasses, forbs and shrubs consistent with Standards of Health and land use plan objectives.

Wildland Fire Suppression and Rehabilitation:

Grass lands, Shrub lands, and Forest lands: Use appropriate management response that is based on consideration of management options and resource values at risk during wildland fire suppression. Weed-free seed should be used and preference should be given to seeding appropriate native plant species when rehabilitation is appropriate. Straw and hay bales used for erosion control should also be weed-free.

Forest lands: Reforestation with appropriate planting stock should occur within the time frame and location identified by the rehabilitation team. Salvage harvest of burned conifer forest resources will be considered on all non-Wilderness or non-WSA lands.

Grazing use: Adjust the amount and timing of livestock grazing following fire occurrence to achieve the standard listed above. Grazing use should be regulated after a fire to encourage the production of understory grasses and forbs.

Rehabilitation: Rehabilitation plans will be developed following fire to determine appropriate site stabilization, re-vegetation, and monitoring.

Riparian Areas and SMZs: Avoid the use of retardant for wildland fire suppression. Wildland fire suppression in riparian areas, or areas that drain into sport fish species, Special Status species (Yellowstone Cutthroat Trout, or TES species habitat would limit the use of heavy equipment and restrict the use of fire retardant over or adjacent to identified habitat of these species.

Weed control: Heavy equipment used in fire suppression should be cleaned before using at a different location to avoid the transfer of noxious weeds. Location of camps and staging areas should avoid high density weed infestation areas.

Burned areas prone to cheatgrass or other noxious weed invasions should be seeded with an appropriate seed mixture to reduce the probability of noxious weeds or other undesirable plants becoming established on the site.

Certified noxious weed seed free seed must be used and preference should be given to seeding appropriate native plant species when rehabilitation is appropriate. Straw and hay bales used for erosion control must also be weed-free.

Prescribed Burning and Other Fuels Management:

Grasslands: Prescribed fire may be used to create fire breaks, reduce fuel loading, increase diversity of vegetation, increase forage production, provide a mosaic of vegetation and land cover, and may be used to manage undesirable plants and weeds.

Shrub lands: If a shrub species is fire adapted, prescribed fire may be used to reduce fuel loading, increase diversity of vegetation and forage production, create mosaics of burned and unburned vegetation to produce diverse age classes and increase forage production.

Forest lands: Prescribed fire may be used to create fire breaks, reduce fuel loading, increase diversity of vegetation, increase forage production, provide a mosaic of vegetation and land cover, dispose of slash following timber harvest, and to manage undesirable species.

Riparian Areas: Prescribed fire and selective cutting may be used in limited situations to restore riparian areas as long as the function of the SMZ is not compromised.

Grazing use: Adjust the amount and timing of livestock grazing prior to and following the use of prescribed fire to achieve proper functioning condition and meet rangeland health standards. Grazing use should be regulated to encourage the production of understory grasses and forbs. Prescribed fire and other fuels management techniques could be used to achieve grazing management objectives.

Forest management: Where appropriate, use all available treatments, including mechanical methods and prescribed fire, to restore forest communities to their historic range of variation (HRV). Where forest stand composition, structures, species mix, and fuel loadings are out of balance; it may not be possible to allow prescribed fire in these communities without unacceptable impacts. Other treatments may be necessary prior to considering the use of prescribed fire.

Fuels management: Hazardous fuels reduction plans should identify areas where prescribed fire and other fuels management techniques could be used to reduce dangerous fuels buildup and achieve other timber management objectives and influence vegetative succession.

Slash burning: Coordinate slash burning with MT Department of Health and Environmental Sciences, Air Quality Division for burn permits.

Weed control: Prescribed burn plans and vegetation treatments must address the presence and expected impact on noxious weeds. Prescribed burning and vegetation treatments should be coordinated with BLM weed experts and/or appropriate county weed supervisors to minimize the spread of weeds.

Vehicles and heavy equipment used for prescribed fires should be washed prior to arriving at a new location to avoid the transfer of noxious weeds.

Visual Resource Management (VRM) Objective: VRM Class I areas (including all Wilderness and WSAs unless specifically exempted in a Resource Management Plan): To maintain a landscape setting that appears unaltered by man. VRM Class II areas: To conduct activities and to design alterations that retain the existing character of the landscape. VRM III areas: To conduct activities and to design alterations so as to partially retain the existing character of the landscape. Class IV: To manage activities so they repeat the form, line, color, and texture of the characteristic landscape.

Wildland Fire Suppression and Rehabilitation:

Equipment restrictions: Avoid the use of heavy equipment and retardant for wildland fire suppression in designated

VRM class I areas unless the impact of the fire would more severely impact VRM Class I than the impact of the equipment and retardant. Use of heavy equipment and retardant in VRM Class I areas must be coordinated by Field Office VRM specialist. Fire rehabilitation of VRM Class I and Class II areas should be coordinated with the Field Office VRM specialist.

Prescribed Burning and Other Fuels Management:

Fuel reduction plans: Hazardous fuels reduction plans on or near VRM class I and class II areas should be coordinated with a VRM specialist to reduce the risk of unacceptable visual impacts.

Wilderness Objective: Protect wilderness characteristics of land within the National Wilderness Preservation System and in Wilderness Study Areas (WSA). Fire management related activities should preserve the natural character of wilderness areas and avoid unnecessary impairment of the area's suitability for preservation as wilderness. Fire management within Wilderness and WSAs should comply with Interim Management Policy for Lands Under Wilderness Review (H-8550-1, J Fire Management).

Wildland Fire Suppression and Rehabilitation:

Fire managers should inform suppression personnel during dispatch that the fire is in a WSA and that special constraints apply. Memorandums of Agreement (MOAs) with other agencies should contain stipulations reflecting wilderness interim management guidance. Use of earth moving equipment will be prohibited for wildland fire suppression unless waived by the Field Manager. Fire managers should notify Field Managers of any unsuccessful initial attack action on a fire in a WSA before developing the Escaped Fire Situation Analysis.

Resource Advisors will use fire plans in making decisions during emergency fire situations and prescribed ignitions. All uses of earth moving equipment within a WSA require authorization.

Light-on-the-land: "Light-on-the-land" fire suppression tactics should be used. The use of heavy equipment during wildland fire suppression and rehabilitation in WSAs should be avoided to protect wilderness characteristics. With authorization, suppression methods may include use of power tools, aircraft, motorboats, and motorized fire-fighting equipment while applying "light-on-the-land" techniques. Placement of fire camps should be outside WSAs. Existing fire lookout towers and helispots may be used and maintained. New fire lookout towers and helispots may be approved as part of the fire management

activity plan if they are the minimum necessary for fire suppression in the WSA. Use of motorized vehicles and mechanical equipment during mop-up should be minimized.

A fire plan for each WSA should specify fire management objectives, existing wilderness characteristics of the area, the need to prevent impairing actions, the natural role of fire, historic fire occurrence, expected fire behavior, acceptable suppression techniques, buffer zones, smoke management concerns, access requirements of other agencies, anticipated effects on private or other agency inholdings, and on adjacent landowners. In planning firebreaks, the use of natural firebreaks and existing roads is encouraged. A Resource Advisor will be on site during wildland fire suppression and rehabilitation efforts to insure compliance with the decisions and guidelines for each WSA.

To hold fire to the desired level in WSAs fire management procedures and plans will rely on 1) the most effective methods of suppression that are least damaging to wilderness values, other resources and the environment, while requiring the least expenditure of funds including rehabilitation of the area, 2) an aggressive fire prevention program, and 3) an integrated cooperative suppression program by DOI agencies and other qualified suppression organizations.

Emergency fire rehabilitation measures will continue to be carried out under guidelines in Handbook H-1742-1 and Manual Section 1742. Efforts should be made to rehabilitate any impacts created by suppression activity prior to releasing fire crews and associated equipment following fire containment.

Prescribed Burning and Other Fuels Management:

Fuels management: All uses of earth moving equipment within a WA or WSA require authorization. The use of heavy equipment should be avoided to protect wilderness characteristics. Staging areas and fire camps should be located outside WSAs. Use of power tools and motorized equipment would be limited to "light-on-the-land" techniques. Use of motorized vehicles and mechanical equipment during mop-up should be minimized.

A prescribed burn plan should specify fire management objectives, historic fire occurrence, the natural role of fire, expected fire behavior, smoke management, effect on private or other agency inholdings, and on adjacent landowners.

Wildlife and Wildlife Habitat Objective: Provide habitat as necessary to maintain a viable and diverse population of native plant and animal species, including special status

species. Provide, maintain, and restore habitat for healthy, productive, and diverse native plant and animal populations and communities.

Wildland Fire Suppression and Rehabilitation:

Minimize the amount of sage grouse habitat burned by giving wildland fire suppression priority to designated known sage grouse habitat within the framework of the Federal Wildland fire Policy (i.e. human life and safety as the first priority).

Appropriate resource staff, including fire specialists and wildlife biologists, will review fire management plans annually to incorporate new sage grouse habitat and other wildlife habitat information in setting wildfire suppression priorities. Distribute updates to fire dispatchers for initial attack planning.

As part of any preparedness planning process, identify the location of known sage grouse habitat and other wildlife habitats of concern so that temporary facilities (such as fire camps, staging areas, and helibases) will avoid disturbance or degradation of designated habitats of concern.

Train and use resource advisors and dispatchers to assist with prioritizing rangeland fires during multiple ignition episodes and to work with Incident Commanders as appropriate.

Ensure that sage grouse and other priority wildlife habitat data are incorporated into each wildland fire situation analysis to assist in determining appropriate suppression plans and prioritizing fires during multiple ignition episodes.

Use direct attack tactics when it is safe and effective at minimizing the amount of sage grouse habitat imperiled by wildland fire.

Retain unburned areas (including interior islands and patches between roads and fire perimeter) of sage grouse habitat unless there is a compelling safety, resource protection, or control objective at risk.

Protect leks, surrounding sagebrush cover, and identified winter range within 400 meters (approximately 1/4 mile) of those leks. Ground disturbing fire suppression actions, such as the use of heavy equipment and excessive brush removal, should be judiciously applied to protect sage grouse habitat.

Evaluate all wildland fires to determine if reclamation is necessary to recover ecological processes and achieve habitat objectives appropriate for biological needs of sage grouse and other wildlife habitats of concern.

Assure that long-term fire rehabilitation objectives are consistent with the desired natural vegetation community.

Align long-term rehabilitation objectives with habitat needs of sage grouse. Seedings should include an appropriate mix of grasses, forbes, and shrubs, including sagebrush, that will recover the ecological processes and habitat features of the potential natural vegetation. Emphasize native plant species and shrub species when these species are adapted to the site, are available in sufficient quantities, and are economically and biologically feasible.

Reseed burned sage grouse habitat within one year unless natural recovery of the native plant community is expected. Areas disturbed by heavy equipment should be given priority consideration.

Prescribed Burning and Other Fuels Management:

Old Growth juniper stands: To protect unique and valuable wildlife habitats and to add variety to juniper stands, prescribed burning of old growth communities of juniper should be avoided. These stands provide islands and edge communities to the prescribed burning areas.

Use prescribed fire or mechanical treatments in degraded aspen stands to improve vigor, stimulate regeneration, and increase vegetative diversity.

Sagebrush: Design vegetation management strategies that are consistent with historical succession and disturbance regimes. In sagebrush communities, the broad scale strategy should be based on comparison of historical and current ecological processes and landscape patterns, and address the seasonal needs of sage grouse and other sage dependent species.

Prescribed fire will not be used in sagebrush habitat unless the treatments are designed to restore ecological processes and achieve specific wildlife habitat enhancements. In known or potential sage grouse habitat, use vegetation treatments and seedings designed to achieve specific objectives for sage grouse or other wildlife species of concern. If fire is the tool used to achieve these objectives, do not burn within two miles of a sage grouse or sharptail lek from March 1 through June 15 each year, within 1/2 mile of a raptor nest from March 1 through August 1 each year, on least tern nesting habitat along the Yellowstone River, within 1,000 feet of blue heron and double-crested cormorant rookeries, or on crucial winter range during periods of use. To maintain viable sagebrush communities for winter range for deer, antelope, and sage grouse, the use of prescribed fire in identified sage grouse habitat will be coordinated with private landowners, and other agencies including US Fish and Wildlife, and MT Fish, Wildlife and Parks.

Use mechanical treatment and prescribed fire to remove juniper and other conifers that have invaded sage grouse habitat and other sagebrush sites before the increasing juniper density reduces species diversity and habitat effectiveness within sagebrush types.

Avoid vegetation treatments in sage grouse habitat areas that are highly susceptible to cheatgrass or other invasive weed species. Any vegetation treatments conducted in annual grassland-dominated communities will be accompanied by restoration, and if necessary, reseeding to achieve re-establishment of native vegetation.

Maintain shrubs along riparian zones, meadows, lakebeds, and farmlands to provide hiding cover for sage grouse broods. Avoid removing this vegetation unless such removal is necessary to achieve habitat management objectives.

APPENDIX B

BILLINGS FIELD OFFICE PROPOSED FIRE MANAGEMENT PLAN

Background: The Billings Field Office is located in south central Montana. It includes approximately 446,000 surface acres of public lands. Grasslands and shrublands are the most common land cover categories. About 175,000 acres or 39 percent of the public lands are considered grasslands. Low and very low cover grasslands are the most common land cover type of public land within the Field Office boundaries. Almost 168,000 acres (38 percent) of the public lands are considered shrubland. Wyoming big sagebrush steppe and big sagebrush steppe are the most common shrub vegetation land cover. Less than 40,000 acres (about 9 percent) of public lands are considered forest lands and less than 4,400 acres (about 1 percent) of public lands are riparian areas. About 11 percent of the public lands are made up of other categories such as exposed rocks and badlands. Between 1978 and 1998, 44 fires were reported to have started on public lands. These fires burned 2,920 acres. Average fire size was 66 acres and the largest fire burned 870 acres of forestlands. Most of the wildland fires occurred in July and August.

The Billings Field Office contains six fire management zones (Billings Grasslands, Roundup, Pryor Mountains, Big Timber/Absaroka, Twin Coulee WSA, and Pompey's Pillar National Monument and ACEC), eight ACECs and one proposed ACEC (Bridger Fossil, Castle Butte, East Pryor Mountains, Four Dances-proposed, Meeteetse Spires, Petroglyph Canyon, Pompey's Pillar, Stark Site, and Weatherman Draw). It also contains four Wilderness Study Areas (WSAs) (Burnt Timber Canyon, Pryor Mountain, Big Horn Tack On, and Twin Coulee). (See Map 3.)

Planning guidance: Current guidance includes The Areas of Critical Environmental Concern ROD (Billings, Powder River and South Dakota, p. 2 & 3) (March 1999), the Billings RMP on pages 2 and 3, the Pompeys Pillar ACEC Management Plan decisions dealing with fire management (page 9) and forestry (page 9).

The Billings RMP will be updated as necessary to include the fire management objectives and guidance for each fire management zone described below.

Wildland fire suppression and rehabilitation guidance common to all areas within the Billings Field Office boundaries: All of the Billings Field Office fire management zones are B category areas. In addition to the state guidelines found in Appendix A, the following resources or values will be given further consideration as specified.

Cultural: "Light on the land" fire tactics would apply when fire threatens high value cultural and paleontological resources and values. Appropriate fireline tactics may include the use of natural barriers and hand constructed fireline.

Prescribed fire and other fuels management guidance common to all areas within the Billings Field Office boundaries. All of the Billings Field Office fire management zones are B category areas. Guidelines are found in Appendix A.

BILLINGS GRASSLANDS (B1)

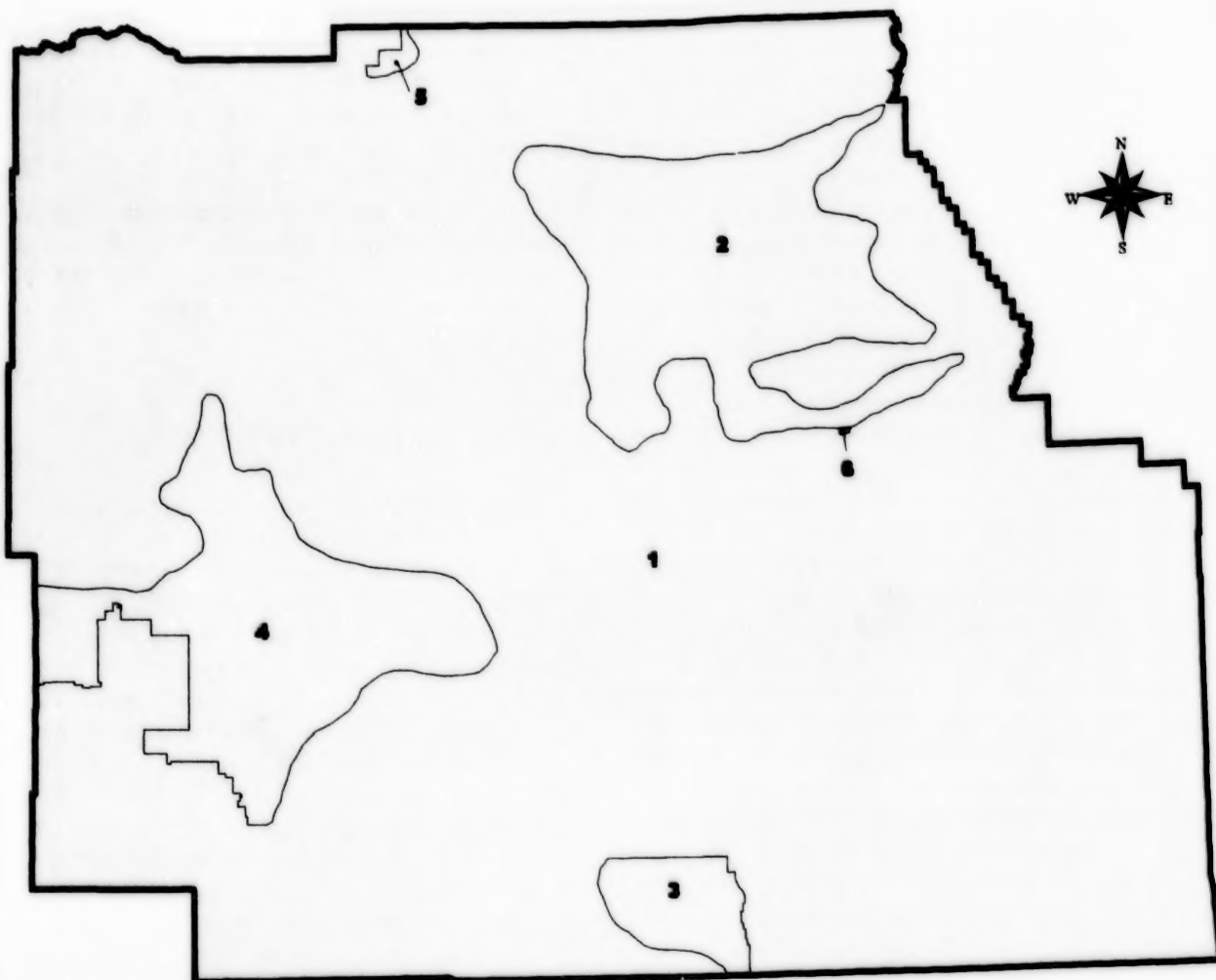
Area description: Except for a few small parcels of public land scattered throughout the area, most of the public land is in northern Musselshell County, eastern Yellowstone County, or in southern Carbon County. The remaining area is predominately private land used for livestock grazing, irrigated farming or small grain production. Wildlife include: whitetail and mule deer, antelope, upland game birds, turkeys, elk, raptors, songbirds and numerous small mammals, amphibians, and reptiles.

The Billings Field Office manages approximately 262,000 surface acres of public lands in the Billings Grasslands (Area 1). Shrublands (approximately 117,900 acres) and grasslands (approximately 108,100 acres) are the most common land cover categories. About 45 percent of the public lands are considered shrubland and 41 percent are grasslands. Less than five percent (about 8,000 acres) are forest lands and less than 2,300 acres are classified as riparian vegetation. The predominant vegetation is western, thickspike and bluebunch wheatgrass, needle and thread grass, green needlegrass intermixed with big and silver sage. Most of the public land exists in scattered ownership patterns with the exception of the Cottonwood Triangle area in Carbon county, which begins south of the city of Bridger, bordered by highway 310 on the east and the Beartooth Mountains on the west, extending to the Wyoming border. This block of public land accounts for the highest incidence of wild fire.

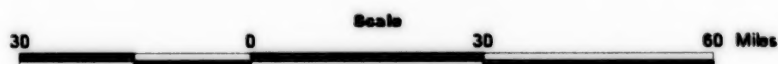
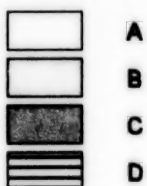
Four additional small areas exist within the Billings Grasslands. These are 1. Sundance Lodge Recreation Area, 2. Four Dances Natural Area, 3. South Hills, and 4. Acton area.

1. The Sundance Lodge Recreation Area is a small tract of land (379.9 acres) at the confluence of the

MAP 3 **BILLINGS FIELD OFFICE**

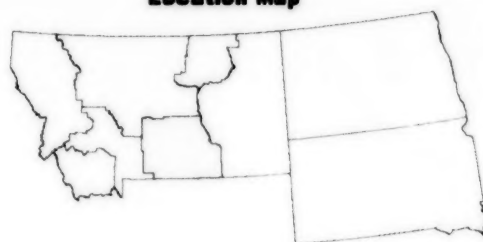


Fire Management Category



- 1 Billings Grasslands
- 2 Roundup
- 3 Pryor Mountains
- 4 Big Timber-Absaroka
- 5 Twin Coulee WSA
- 6 Pompeys Pillar

Location Map



Yellowstone and Clarks Fork of the Yellowstone river, south of the city of Laurel. The area consists of farm land intermixed with mature cottonwood and shrubs, along the Clarks Fork River. This area includes habitat for whitetail deer, pheasants, waterfowl, and songbirds. Fuel models 1,2,5 and 6. Fuel loads range from .74 to 6.0 ton/acre.

2. The Four Dances Natural Area (765 acres) is a tract of land immediately south of Billings. Heavy recreation use is anticipated due to proximity to the city of Billings. This area consists of native grasses including wheat and needle grasses, sagebrush and pine along the rims above the Yellowstone River and cottonwood and brush along the river bottom. This area has been nominated for ACEC status. Fuel models 1, 5. Fuel loads range from .74 ton/acre to 3.0 ton/acre.
3. The South Hills area is directly south of Billings along the Yellowstone River. This tract of land lies between the river and a developed subdivision. The vegetation includes native wheat grass and needle grasses, sagebrush and a small amount of pine. This area fits fuel model 1. Fuel loads average .50 ton/acre.
4. The Acton area consists of six sections of public land north of Billings. The area consists of native wheat grass, needle grasses with mixed pine and big sagebrush. Grazing and recreation are the primary uses of this area which fits fuel models 1 and 2. Fuel loads range from .74 tons/acre to 4.0 tons/acre.

These areas require special considerations due to urban interface, ACEC issues and higher fire danger resulting from heavy recreational use. Fuel models 1 and 5 fit the majority of this area, with fuel types 6 in the Clarks Fork Recreation area. The topography is generally rolling hills. Soils vary from silty 10-14 inch precipitation zone (PZ) to dense clay-clayey-saline upland complex 5-9 inch PZ.

Wildland fire history: Between 1978 and 1998, 26 fires started on BLM administered public lands. These fires burned an estimated 1,060 acres. Most of the area burned (approximately 940 acres) was shrublands. Only about 120 acres of grasslands and less than 3 acres of forest lands burned during this period. The largest fire burned almost 80 acres of shrublands. Average fire size was 12 acres on shrublands and about 10 acres of grasslands. The largest grassland fire was about 50 acres. More than 75 percent of all the BLM fires were less than 10 acres in size. Only one fire on shrublands was larger than 100 acres.

Interface: Urban interface is scattered throughout the parcels of public land. The heaviest concentration of

developments near BLM land is around the Sundance Lodge Recreation Area exchange and South Hills areas. Other interface areas include Shepard Ah Nei, Four Dances Natural Area, and the Acton area.

Area concerns and constraints: Concerns include the North Absaroka and Washakie Wilderness class I airsheds to the south, the Billings and Laurel air quality non-attainment areas, urban interface (Sundance Lodge Recreation Area and South Hills), heavy fuel loading in the Sundance Lodge Recreation Area, and high fire danger associated with heavy recreational use (South Hills, Acton area, Sundance Lodge Recreation Areas, Four Dances Natural Area). The public is especially concerned about fire management on the Four Dances Natural Area and Sundance Lodge Recreation Area due to proximity to Billings and Laurel. Concerns that require fire management consideration are: forage production, riparian areas, wildlife habitat on public lands, and crop and forage production on adjacent private lands. Areas nominated for ACEC designation include the Bridger Fossil area for paleontological values, the Castle Butte Site for rock art, Meeteetse Spires for unique vegetation and scenic values, the Stark site for cultural values, Weatherman Draw for rock art and unique cultural values, and the Four Dances Natural Area for cultural, historic, and natural hazard values. The Acton area, Hamilton's (Asparagus) Point, Shepherd Ah-Nei area (North portion), and the South Hills all have OHV restrictions.

Resource objectives: Resource objectives include: 1) maintaining native species where they currently exist while managing non-native weeds, 2) managing for diversified grasslands which provide livestock and wildlife forage, and nesting and rearing habitat, 3) managing for a healthy mix of grass prairie with a diversity of warm and cool season perennial grass species with minor components of shrubs. Other objectives include limiting or minimizing erosion; maintaining sagebrush cover with a mosaic of community and dispersion of plants; maintaining sagebrush cover in designated Sage grouse wintering/ nesting areas; protecting, maintaining, and enhancing crucial wildlife habitats, wetland and riparian habitats, existing or potential fisheries habitats, and habitats for threatened and endangered species. Unique resource values at Crooked Creek Natural Area have been identified for protection.

Fire objective: Wildland fire is not desired due to urban interface, ACECs, the large amount of agricultural production and other values and uses on private and state land. The appropriate management response to wildland fire within the Billings Grasslands would generally be aggressive fire suppression. Prescribed fire may be used in the Billings Grasslands.

Wildland fire suppression and rehabilitation guidance:

Cultural - The application of fire retardant would be avoided within the Petroglyph Canyon ACEC and Weatherman Draw ACEC that contain petroglyphs and pictographs. A Resource Advisor will be on site during wildland fire suppression and rehabilitation efforts to insure compliance with the decisions and guidelines for each of the following ACEC areas: 1. Bridger Fossil area ACEC, 2. Stark Site ACEC, 3. Petroglyph Canyon ACEC, 4. Weatherman Draw ACEC, and 5. Meeteese Spires ACEC.

ROUNDUP (B2)

Area description: The Billings Field Office manages approximately 88,000 surface acres of public lands in the Roundup area (area 2). Most of the parcels of public land are in southern Musselshell and northern Yellowstone counties. Grasslands (approximately 42,000 acres) and shrublands (approximately 40,000 acres) are the most common land cover categories. About 48 percent of the public lands are considered grasslands and 45 percent are shrublands. About six percent (about 5,700 acres) are forest lands and less than 400 acres are classified as riparian vegetation. Vegetation within the area consists primarily of ponderosa pine, and Rocky Mountain juniper, intermixed with little bluestem, bluebunch and western wheatgrass, sideoats grama, native legumes, and sage brush. Ponderosa pine and grasses are characteristic of Fuel Models 1 and 2. Sagebrush areas are characteristic of Fuel Model 5. The predominant fuel models on public lands are models 1 and 5, with fuel load averages of .74 tons/acre to 3.0 tons/acre. Isolated parcels of public land consist of Ponderosa pine/native grasses mix, Fuel Model 2, with fuel loads of 4.0 tons/acre.

The topography consists of rolling to hilly and broad valleys, draining into the Musselshell River on the north and the Yellowstone River on the south. Soils are forest-grassland complex 10-14" PZ. This area provides habitat for deer, antelope, elk, grouse, pheasants, wild turkeys, waterfowl, raptors and songbirds. Numerous cultural sites exist within this area. The area is predominately used for livestock grazing and dryland farming. The area is rich in coal and has a history of coal production. Most of the land within this area is private with parcels of public land scattered throughout the area. Heavy recreational use and urban interface pose a special concern on a 4,800 acre parcel of public land within this area known as Ah-Nei, which is located north of the town of Shepherd. A large subdivision and numerous small homes form the west border of the Ah-Nei area. This area is used for grazing and provides recreational opportunities for motorcycles, dirt bikes, hikers, and horseback riders.

Wildland fire history: Between 1978 and 1999, 16 wildland fires started on BLM-administered public lands. Five of these fires started on grasslands, 10 started on shrublands, and one started on forestlands. These fires burned an estimated 1,880 acres. The area burned was about equally split between grasslands (approximately 950 acres) and shrublands (approximately 930 acres). The only fire on forestlands burned six acres during this period. The largest fires burned 640 acres of shrublands. Average fire size was 190 acres on grasslands but only about 90 acres on shrublands. The largest grassland fire and the largest shrubland fire were the same size at about 640 acres each. More than 70 percent of all the BLM shrubland fires and 40 percent of grassland fires were less than 10 acres in size. Only one fire on shrublands was larger than 100 acres.

Interface: Urban interface is scattered throughout the parcels of public lands with the largest concentration near the Shepard Ah-Nei area.

Area concerns and constraints: Concerns include the Billings and Laurel air quality non-attainment areas, urban interface (especially near the Ah-Nei area), unique cultural values (rock art) at Castle Butte ACEC, forage production, riparian areas and wildlife habitat on public lands as well as crop and forage production on adjacent private lands. Hamilton's (Asparagus) Point, Shepherd Ah-Nei area (North portion), and the Butte all have OHV restrictions. Coal seams at the surface in the Bull Mountains are a concern for fire management. The Crooked Creek drainage has been identified as Special Status Species habitat.

Resource objectives: Resource objectives include maintaining native species where they currently exist while managing non-native weeds; management of the area for diversified grasslands which will provide livestock and wildlife forage, and nesting and rearing habitat; and management for a healthy mix of grass prairie with a diversity of warm and cool season perennial grass species with minor components of shrubs. Other objectives include limiting or minimizing erosion; maintaining sagebrush cover in a mosaic community and dispersion of plants; maintaining sagebrush cover in designated sage grouse wintering/nesting areas; protecting, maintaining, and enhancing crucial wildlife habitats, wetland and riparian habitats, existing or potential fisheries habitats, and habitats for threatened and endangered species. OHV use restrictions exist to protect designated resource values.

Fire objective: Wildland fire is not desired due to urban interface, ACEC issues, and the large amount of agricultural production especially on adjacent private and state land. Appropriate management response to wildland fire would be aggressive suppression. Prescribed fire may be used to reduce fuels buildup or to mitigate or avoid effects of wildland fire.

Wildland fire suppression and rehabilitation:

Cultural- The application of fire retardant would be restricted within the Castle Butte ACEC.

PRYOR MOUNTAINS (B3)

Area description: The Pryor Mountains are located 30 miles south of Billings in Carbon county. Four Wilderness Study Areas (WSAs) exist in the Pryor Mountains: 1. Pryor Mountain WSA, 2. Big Horn Tack On WSA, 3. Lost Water WSA (Forest Service), and 4. Burnt Timber Canyon WSA. This area also includes the East Pryor Mountain Horse Range ACEC encompassing the Pryor Mountains wild horse range. Public lands adjoin the Crow Reservation on the north and the Big Horn Canyon National Recreation Area on the east and Pryor Mountain unit of the Beartooth National Forest on the west. The remaining area is surrounded by private lands. The majority of the land is public ownership administered by the US Forest Service and the Bureau of Land Management. Small tracts of private land intermingle with public lands along the border with the Crow Reservation. BLM is responsible for fire protection on all public land within this area including private lands for which wildfire protection is the responsibility of BLM (affidavit lands). These affidavit lands are located in the Sage Creek drainage within the boundaries of the Beartooth unit of the Custer National Forest. The terrain is very steep with elevations to 8,300 feet. Deep, vertical walled canyons cut into the limestone. Chimney canyons, steep slopes, strong upslope winds and difficult access pose fire control concerns. Two flowing creeks, Crooked Creek and Sage Creek, form the major drainage. Crooked Creek flows into Big Horn Lake. Sage Creek drains to the north and west around the mountain and then south to the Shoshone river.

The Billings Field Office manages approximately 43,000 surface acres of public land in the Pryor Mountains area (area 3). Grasslands (approximately 20,800 acres) make up 49 percent of the land cover; shrublands (10,800 acres) make up 25 percent of the land cover; and forestlands (10,300 acres) make up about 24 percent of the land cover. Vegetation can be broken into two distinct groups: 1. mature Subalpine fir/spruce and Douglas fir, limber pine forest, intermingled with grassland made up of: Idaho fescue, bluebunch and slender wheatgrass, Columbia and green needlegrass, lupine, larkspur and black sagebrush, with pockets of isolated lodgepole pine forest, and 2. a band of Rocky mountain Juniper/mahogany and big sagebrush along the south aspect at lower elevations. Fuel loads range from .74 ton/acre in the grassy areas to 3 to 5 tons/acre in the Douglas fir complex. The majority of fuels fit the fuel models 1, 8, and 10.

Soils range from silty range 10-14 inch PZ to grazable woodland complex in the 15-19 inch PZ, with calcareous sub soils on steep mountain slopes. Numerous cultural sites exist in the area. The area has a history of shaft mining for uranium and contains a number of old mine shafts, numerous claim validation pits and roads from past mining activities. This area provides habitat for deer, big horn sheep, black bear, wild horses, blue grouse, ruffed grouse, raptors and song birds. Trout habitats in Crooked Creek and the Big Horn river are impacted by runoff. Insect infestation exists in the east portion along the south aspect. The area is predominately used for timber, firewood, recreation and livestock grazing. Area ownership is approximately 30 percent BLM, 1 percent private, and 69 percent Forest Service (FS).

Wildland fire history: Between 1978 and 1999, nine fires started on BLM administered public lands. Two of these fires started on grasslands, three started on shrublands, and three started on forestlands. These fires burned only 10 acres, most of which was shrublands.

Interface: Urban interface exists in the Sage Creek area. Private cabins and several working ranches make up the creek bottom. Most cabins are inhabited only periodically. The private lands within this area subscribe to and are classified as affidavit lands.

Area concerns and constraints: Concerns include firefighter safety due to steep terrain, chimney canyons, strong upslope winds and heavy fuel loading. Other concerns include providing protection to affidavit lands in the Sage Creek area, protecting the Pryor Mountains wild horse range ACEC values, protecting cultural resources in the East Pryor Mountains ACEC, commercial timber on adjacent Forest Service land, crucial wildlife habitat, watershed values, controlling weeds, and complying with OHV restrictions on the Pryor Mountain Wild Horse Range and four WSAs.

Resource objectives: Resource objectives include providing a mosaic of forage and cover types to accommodate wildlife species, limiting or minimizing erosion, maintaining the natural vegetation and landform characteristics to protect the WSAs and the East Pryor Mountain ACEC values, maintaining a mosaic of vegetation that provides 10 to 30 percent sagebrush/curlleaved mountain mahogany, and maintaining sagebrush cover in designated mule deer/ bighorn sheep wintering areas.

Fire objective: Wildland fire is not desired due to the East Pryor Mountain ACEC guidelines, Wilderness Study Areas, Crow Reservation lands, Forest Service lands, timber and other resources of high value. Since steep

terrain and heavy fuel loads in some areas compromise fire fighter safety, modified suppression may be used to assure safety. Appropriate management response would be aggressive fire suppression. Prescribed fire and other fuels management strategies may be used to reduce hazardous fuels or to mitigate or avoid effects of wildland fire.

Wildland fire suppression and rehabilitation: "Light on the land" and conditional fire suppression tactics, consistent with resource, ACEC and wilderness study area guidelines may be used to protect resource values.

Grazing Management: Management options which encourage the production of understory grasses and forbs by limiting wild horse grazing will be considered after a wildland fire.

BIG TIMBER/ABSAROKA (B4)

Area description: Public lands exist in scattered parcels in Sweetgrass and Stillwater counties. Some parcels are in the foothills adjoining the Beartooth /Absaroka mountain ranges south and west of Big Timber and extend south to Beehive. The Gallatin and Beartooth National Forests border many of these tracts on the south. Portions of the adjacent Absaroka/Beartooth wilderness area contain decadent stands of lodgepole pine. The topography consists of rolling and very steep hills, which drain into the Boulder, Yellowstone, and Stillwater Rivers. Other parcels are scattered throughout the area and are surrounded by private land.

Approximately 17,200 acres of public land are scattered throughout area 4. About half (8,400 acres) is classified as forestland, 38 percent (6,500 acres) is grasslands, and 12 percent (2,100 acres) is shrublands. The predominate vegetative type is Douglas fir forest, fuel model 8, mixed with rough fescue, Idaho fescue, bluebunch and slender wheatgrass, mountain brome and big sagebrush, fuel models 1 and 5. Fuel loading ranges from .74 tons/acre to 3 tons/acre. Portions of the Beartooth Wilderness Area are included in the boundary. Soils are generally silty 10-19" PZ. This area provides habitat for deer, elk, bear, grouse, raptors and songbirds. Fish habitat is affected in the Yellowstone, Stillwater, and Boulder rivers by runoff from these drainages. The primary use of the area is for timber, firewood, recreation, and livestock grazing. Access is generally good, with the exception of occasional locked gates on private land.

Wildland fire history: No wildland fires were reported on public lands between 1978 and 1999.

Interface: Urban interface is scattered throughout the area.

Area concerns and constraints: This area experiences high winds which can be extreme, creating extreme, erratic, fire behavior. Large amounts of state, private and public lands are intermingled with public lands. The area contains high value timberland and wildlife habitat, including elk winter range. Other concerns include the potential effects on fisheries in the Yellowstone, Stillwater, and Boulder rivers. Special Status fish species habitat exists in Bad Canyon, and OHV use is restricted in Bad Canyon.

Resource objectives: Resource objectives include managing to provide a mosaic of forage and cover types to accommodate wildlife species, protecting timber values, maintaining crucial wildlife habitat, and preserving recreation opportunities. The vegetation management objective is to manage for a healthy mix of grass prairie with a diversity of warm and cool season perennial grass species with minor components of shrubs.

Fire objective: Wildland fire is undesirable because of commercial timber, agricultural production, private and state land, adjoining wilderness and Forest Service lands. The appropriate management response to wildland fire in this area would be aggressive fire suppression. Prescribed fire and other fuels management strategies may be used to reduce hazardous fuels or to mitigate or avoid effects of wildland fire.

Wildland fire suppression and rehabilitation: Careful evaluation of erosion potential and habitat damage before using earth moving/tillage equipment is appropriate.

TWIN COULEE WSA (B5)

Area description: Twin Coulee WSA is a block of public land in Golden Valley county south of Lewistown. It borders the south edge of the Snowy Mountains and adjoins the Lewis and Clark National Forest on the north. Private lands border the public lands on the east and south sides. Much of the private lands have been commercially logged and provide roads for access and fire control.

The Twin Coulee WSA consists of approximately 7,000 acres of public land, of which 96 percent is classified as forestland. Vegetation consists of ponderosa pine/Douglas fir on the east side, Douglas fir forest complex on the south and west (fuel model 8, fuel loads of 5.0 tons/acre), and limber pine at lower elevations (fuel model 2 with fuel loads of 4.0 tons/acre). Islands of lodge pole pine are

intermingled with the Douglas fir stands on the south side of the area and encompass large areas in the adjoining Forest Service lands (fuel model 10 with fuel loads of 8-10 tons/acre). Open parks are made up of Fescue, Colombia needlegrass, bearded wheatgrass, mountain brome, and many forbes (fuel models 1 and 5 with fuel loads of .74 to 3.0 tons/acre). Slopes are very steep and rocky with a south aspect. Soils are shallow silty in the 10-14 inch precipitation zone. Some areas are very rocky and subject to erosion. Heavy fuel loading occurs, except in areas that have burned recently. These areas are prone to pine beetle infestations. Historic burn characteristics show the area is susceptible to severe damage from wild fire.

Wildland fire history: Between 1978 and 1998, only two fires started on public lands. One of these burned about 870 acres and the other burned about two acres. Both fires occurred on forestland.

Interface: A single cabin exists on private land adjacent to the WSA.

Area concerns and constraints: Concerns which affect wildland fire severity and firefighter safety include heavy fuels, steep slopes, beetle infestation, distance from Billings, and accessibility. Other concerns include wildlife habitat and watershed protection, valuable resources on adjacent private lands, compliance with the guidelines of the WSA, and high erosion potential.

Resource objectives: Public lands will be managed to provide a mosaic of forage and cover types to accommodate wildlife species. The natural vegetation and landform characteristics would also be maintained to protect WSA characteristics. Timber values should be protected as much as possible, while maintaining habitat for wildlife.

Fire objectives: The concerns and constraints noted above make wildland fire undesirable. The appropriate management response to wildland fire within the Twin Coulee WSA would include the most effective methods of suppression that are least damaging to the wilderness values and other resources. These suppression efforts will also be in compliance with the WSA guidance and in a way that minimizes potential habitat destruction and erosion. Careful consideration of the potential benefits, values protected, and erosion potential will precede the use of heavy equipment. Prescribed fire and other fuels management strategies may be used to create fire breaks, reduce fuel loading, or to mitigate or avoid effects of wildland fire. Prescribed fire may also be used in the WSA but would avoid unnecessary impairment of the area's suitability for preservation as wilderness.

POMPEYS PILLAR NATIONAL MONUMENT AND ACEC (B6)

Area description: Pompeys Pillar National Monument (approximately 51 acres) and the surrounding Pompeys Pillar ACEC area (approximately 431 acres) are 30 miles east of Billings along the Yellowstone River. This area consists of the six-acre national landmark, the monument, a visitor center and associated outbuildings, irrigated cropland, and a large island in the Yellowstone river.

Climate is typical of semi-arid environment. Summers are warm with temperatures sometimes exceeding 100 degrees, July high temperatures average in the low 80's, while January highs are in the teens. Annual precipitation averages 10-14 inches with 60 percent of the growing season moisture coming during May and June. Hail, severe thunder storms and blizzards often occur and sometimes damage property or threaten lives.

Pompeys Pillar is an isolated block of sandstone on the south side of the river bank of the Yellowstone River. The pillar landform rises abruptly more than 100 feet above the surrounding level plain. The materials forming the pillar, as well as the rugged cliffs on the north side of the river, probably correspond to the Hell Creek formation. The Pillar itself is designated a National Historical Landmark because of the significance of William Clark's signature and the association of the Pillar with the Lewis and Clark Expedition.

This area provides habitat for whitetail deer, pheasants, waterfowl, raptors, and songbirds.

The area is characterized by fuel loads that range from .74 to 6.0 ton/acre. Fuel models 1 and 5 fit the majority of this area, and with fuel types 6.

The topography is generally rolling hills. Soils vary from silty in the 10-14 inch precipitation zone to dense clay-clayey-saline upland complex in the 5-9 inch precipitation zone. Most of the land south and east of the pillar has been cultivated for the past 50-100 years. Some of this area near the pillar will be planted with native vegetation. The land north and east of the pillar has not been cultivated and is presently covered with a dense cottonwood riparian woodland.

Wildland fire history: Since 1991, when the BLM acquired Pompeys Pillar, there have been three wildland fires on the property. The largest burned less than 20 acres of woodlands on the island; another burned less than 0.1 acre of grasslands at the base of the Pillar; and the third occurred on grasslands and shrubs along the railroad tracks along the Southeast boundary of the ACEC.

Interface: The BLM proposes to build a 5,700 square foot interpretative center east of the Pillar along the edge of the cottonwood trees and remove the existing visitor center east of the Pillar. A day-use area immediately north of the center is also proposed.

Area concerns and constraints: Fire management concerns include the potential for fires from an estimated 130,000 visitors per year. The peak period for visitors occurs during mid to late summer when temperatures are warm and the potential for fire danger is high. Other concerns include the presence of a national landmark, a national monument, an ACEC, and other archeological and historic resources. Structures that need fire protection include a visitor center and a proposed interpretative center.

Resource objectives: Emphasize both the recreation and the historic setting of 1806 with a moderate level of facility development and visitor services. Prepare and manage the area for the Bicentennial of the Lewis and Clark Expedition (2003-2006). Accommodate a large number of visitors (estimated 130,000 annually). Preserve the Montana Class II air quality designation. Preserve the rock art and inscription panels on Pompeys Pillar NHL. Identify, record and evaluate additional cultural properties. Protect cultural sites. Limit the use of OHV to designated roads and trails. The Class II visual resource management (VRM) objective for the NHL is to retain the existing character of the landscape (the level of change to the landscape should be low). The VRM class III management objective of the remainder of the Pompeys Pillar ACEC is to partially retain the existing character of the landscape (the level of change to the characteristic landscape should be moderate). Maintain natural riparian areas in Proper Functioning Condition, provide forage and cover with plantings, and improve fisheries habitat on the channelized stream. Maintain the existing canopy cover of the cottonwood bottoms. Minimize the potential for hazardous materials contamination. Maintain soil productivity, prevent and/or minimize accelerated soil erosion, prevent and/or

minimize flood damage and protect municipal and domestic water supplies. Control weeds and insects while minimizing the use of chemicals.

Fire objectives: Wildland fire is not desired due to the National Historic Landmark, the National Monument, the ACEC values, large amount of visitor use, adjacent private land, and structures. The appropriate management response to wildland fire within Pompeys Pillar would include the most effective methods of suppression that are least damaging to the National Historic Landmark, the Monument, and to the ACEC values and resources. Prescribed fire may be used to reduce fuels buildup, restore the natural environment, or to mitigate or avoid effects of wildland fire.

Wildland fire suppression and rehabilitation:

Initial Attack: Initial attack would continue to be coordinated through agreements with local fire departments.

National Historic Landmark and National Monument: Initial attack would be restricted to application of water. No heavy equipment, hand tools, or mechanized equipment that would cause surface disturbance would be allowed.

Remainder of land at Pompeys Pillar: Appropriate management response to wildland fire in the rest of the area would allow the use of available resources including dozers, motor graders, tractors with plows, air tankers, and fire fighting crews except as noted below and listed in management common.

Riparian areas: Use of retardant and heavy equipment would not be allowed in riparian areas.

Prescribed burning and other fuels management:

Forestry: Wood product sales would be allowed to remove hazardous fuels.

APPENDIX C

BUTTE FIELD OFFICE FIRE MANAGEMENT PLAN

Background: The Butte Field Office contains one ACEC (Sleeping Giant) and five Wilderness Study Areas (WSAs) (Humbug Spires, Sleeping Giant/Sheep Creek, Black Sage, Yellowstone River Island, and Elk Horn). (See Map 4.)

Planning guidance: Current guidance comes from the Headwaters Resource Management Plan (RMP), 1984. This plan establishes modified suppression criteria when appropriate based on values at risk, fire behavior and occurrence, and consistency with other agency plans and policies. Prescribed fire may be used in support of resource management objectives. (See Headwaters RMP, July, 1984, page 24). Fire management is also subject to the decisions contained in the Standards for Rangeland Health and Guidelines for Grazing EIS/ROD (8/97), Elkhorn Mountains Travel Management Plan Amendment/EIS (8/95), and the Outstanding Natural Area Environmental Assessment Decision Record/Amendment (12/86).

The Headwaters RMP will be updated as necessary to include the fire management objectives and guidance for each fire management zone described below.

Wildland fire suppression and rehabilitation guidance common to all areas within the Butte Field Office boundaries: In addition to the state guidelines found in Appendix A, the following resources or values will be given further consideration as specified.

Forestry: Salvage harvest of forest products may be used to meet resource objectives and to reduce hazardous fuels. Rehabilitation will aim to restore natural forest conditions.

Wildlife: Post-wildland fire management (i.e. salvage logging) would be consistent with policy for Special Status species.

Prescribed fire and other fuels management guidance common to all areas within the Butte Field Office boundaries: In addition to the state guidelines found in Appendix A, the following resources or values will be given further consideration as specified.

Weeds: A specific course of action for noxious weeds located on or near proposed prescribed burn units will be determined on a case-by-case basis depending on size of weed infestation, species of noxious weed, knowledge of the weed species involved and fire effects on each species. Any course of action will use the BLM plan "Partners Against Weeds" (January, 1996) in prescribed fire plans.

Wildlife: Prescribed fire projects will not be authorized within sensitive fish, wildlife, and botany habitats when the burn would impair the functioning of the habitats. Prescribed fires will be designed to maintain or enhance native plant communities in support of fish, wildlife and botany populations. For threatened, endangered, and BLM Special Status species, projects will be consistent with recovery and conservation plans, and the Bureau's Special Status policy to conserve threatened, endangered and BLM Special Status species and their habitats.

BIG HOLE RIVER CORRIDOR (C3)

Also see Dillon Field Office

Area description: Approximately 50 percent consists of open sagebrush/grass parks. Another 45 percent is Douglas fir. Mountain mahogany is scattered throughout the area occurring on steep, rocky south and west-facing slopes. Much of this is overtopped by Douglas fir. The remaining 5 percent of the area contains drainages dominated by lodgepole pine. The area is characterized by steep topography and close proximity to the highway. The area includes approximately 68,800 acres (26 percent BLM, 3 percent state, 25 percent private, and 46 percent FS). The area is also characterized by numerous roads from past mining activities.

Wildland fire history: Between 1978 and 1999, federal agencies responded to 16 fires which burned an estimated 14,500 acres. Average fire size was 905 acres.

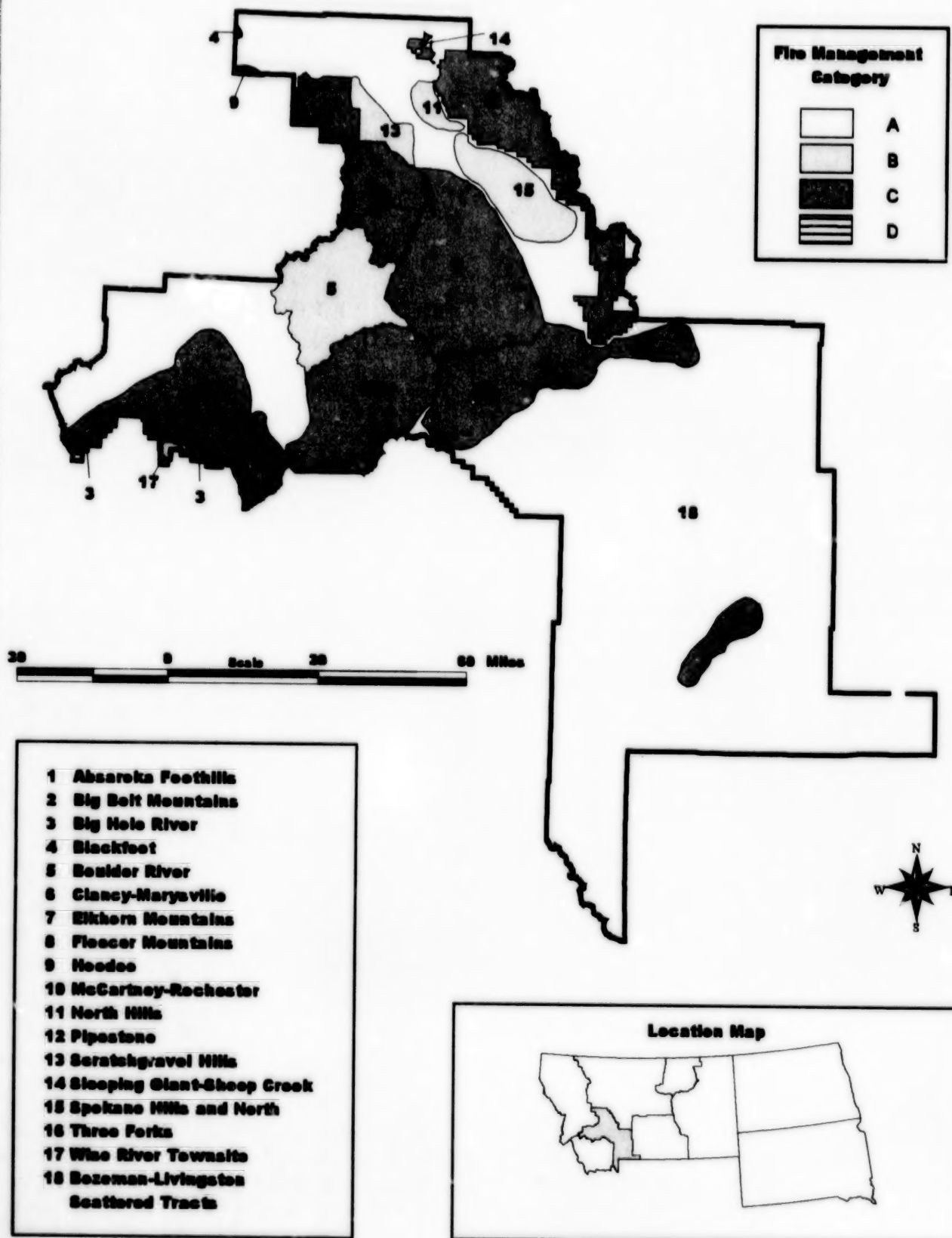
Intermix: Numerous homes and ranches are present along the Big Hole River corridor.

Area concerns and constraints: Fire management should be coordinated with the Forest Service. Steep topography and close proximity to the highway and private land limit suppression options.

Resource objectives: Reduce conifer encroachment into sagebrush/grass foothills and parklands to improve winter habitat for mule deer and elk. Protect one mile corridor along the Big Hole River for visual quality.

Fire objectives: Fire, subject to the constraints listed above, may be desired to help manage the ecosystem. Fire and other methods may be used to limit the encroachment of Douglas fir into open sagebrush parks and areas of mountain mahogany.

MAP 4 **BUTTE FIELD OFFICE**



Wildland fire suppression and rehabilitation: Riparian areas and fisheries habitat: No heavy equipment or retardant would be allowed along the primary floodplain of the Big Hole River to protect the sport fisheries resource and the Arctic Grayling.

Prescribed fire and other fuels management: Any prescribed burns would be carefully planned to assure an adequate seed source for mountain mahogany and to create a mosaic of seed plants and bare mineral soil.

NORTH HILLS (B11)

Area description: The northern half of this area is predominately grassland. The southern portion contains dense stands of ponderosa pine and several subdivisions. The area includes approximately 32,349 acres (20 percent BLM, 7 percent state, and 73 percent private). The Madison Valley is primarily private land with numerous subdivisions.

Wildland fire history: In 1984 a large fire burned the northern half of the area. Between 1978 and 1999, federal agencies responded to three fires which burned an estimated 5,243 acres. Average fire size was 1,748 acres.

Intermix: This area contains numerous subdivisions. North Hills is in Lewis and Clark County near Helena. It has medium population density, medium escaped fire potential, and medium potential for loss of life or property. Community support is high and there is a medium level of community support.

Area concerns and constraints: Wildland fire is not desired due to large amounts of private land and rural subdivisions. Traditional big game winter range also exists within the area. Fire management will also need to be coordinated with the adjoining Forest Service Landscape Plan.

Resource objectives: Protect urban interface areas and maintain visual values.

Fire objective: Wildland fire is not desired in this area due to the interface with subdivisions and other developments. The appropriate management response to wildland fire within the North Hills area will be aggressive fire suppression. Prescribed fires may be used to reduce hazardous fuels.

Wildland fire suppression and rehabilitation: Confine or contain unplanned ignitions to smallest feasible size.

Visual resources: Fire rehabilitation should be coordinated with the Field Office VRM specialist and protected as much as possible.

SCRATCHGRAVEL HILLS (B13)

Area description: This area is approximately four miles northwest of Helena in Lewis and Clark County and is characterized by grassland hills which have been colonized by dense stands of ponderosa pine of varying age classes. Private homes and developments have been built throughout the area. The area includes approximately 58,590 acres (12 percent BLM, 3 percent state, and 85 percent private).

Wildland fire history: Between 1978 and 1999, federal agencies responded to six fires which burned an estimated 5,370 acres. Average fire size was 895 acres.

Intermix: The area contains numerous subdivisions and access is limited. Population density is high; escaped fire potential is medium; the potential for loss of life or property is high; community support and community safe efforts are high. The area has a high density of homes and roads.

Area concerns and constraints: The development of private homes and subdivisions as well as the growth of Helena near public lands complicate fire management. Smoke and air quality impacts from fires affect people in Helena and surrounding areas. Fires could threaten historical mining features.

Resource objectives: Manage fire to protect subdivision areas and visual quality.

Fire objectives: Wildland fire is not desired due to the interface with subdivisions and other developments. Appropriate management response to wildland fire will be aggressive suppression. Confine or contain unplanned ignitions to smallest feasible size. Prescribed fire may be used in the Scratchgravel Hills. Other methods may also be used to reduce hazardous fuels and to protect nearby subdivisions and other developments.

WISE RIVER TOWNSITE (B17)

Area description: The area is characterized by steep topography and close proximity to the highway. The area includes approximately 10,100 acres (14 percent BLM, 1 percent state, 78 percent private, and 7 percent FS). The area is also characterized by numerous roads from past mining activities.

Wildland fire history: Between 1978 and 1999, federal agencies responded to five fires which burned less than three acres. Average fire size was about .5 acres.

Intermix: Wise River townsite is in Beaverhead County. Population density is medium; escaped fire potential is medium; potential for loss of life or property is low; and community support and community safe efforts are medium. The area has high value property and sensitive viewsheds along the Big Hole River corridor. There is close proximity to private land and structures. It is an interface area that is expanding from the townsite and is becoming more difficult to defend from potential wildfire.

Area concerns and constraints: Proximity to private land and structures limits suppression options. Obvious concerns focus on structural developments, croplands, livestock and livestock forage needs.

Resource objectives: Manage native vegetation to meet standards for rangeland and forest health. Maintain stable soils and sustain current land uses. Sagebrush habitats, especially those identified in wintering areas and big game concentration areas should be maintained to the maximum extent possible.

Reduce the long-term fire hazard on BLM lands adjacent to developed areas by reducing stocking densities of forest stands. Maintain or enhance aspen clones in the vicinity of the Scenic Byway.

Fire objective: Wildland fire is not desired due to density of structures and large amount of private land. Appropriate management response to wildland fire will be aggressive suppression. Confine or contain unplanned ignitions to smallest feasible size. Prescribed fire may be used in the Wise River Townsite to reduce hazardous fuel conditions.

BOZEMAN/LIVINGSTON SCATTERED TRACTS (A18)

Area description: This area consists of numerous tracts with various fuel types scattered throughout the Bozeman and Livingston area. The total size and percent of land administered by the BLM is unknown.

Area concerns and constraints: The scattered land pattern and large areas of adjoining private land make modified fire suppression or active prescribed fire impractical. This area also contains the Yellowstone River WSA.

Resource objectives: Protect interface/intermix areas.

Fire objectives: Wildland fire is not desired in this area due to the large amount of private and agricultural land, interface with subdivisions, and other developments. The appropriate management response to wildland fire within the Bozeman and Livingston scattered tracts would be

aggressive fire suppression. Confine or contain unplanned ignitions to smallest feasible size. Prescribed fires would not be used in this area due to the large amount of private land, agricultural lands, and rural subdivisions.

Wildland fire suppression and rehabilitation:

Special areas and wilderness study areas: This area contains the Yellowstone River Island WSA. See guidance for wildland fire suppression and rehabilitation within WSAs. This area has high resource values including cultural, relic vegetation, high visual and scenic values. A Resource Advisor shall assist the Incident Commander in making suppression decisions. This area will normally involve an alternate suppression strategy due to limited access. Intensive fire suppression techniques will not be used.

BOULDER RIVER (B5)

Area description: This area contains approximately 40 percent transitional woodland fuel type dominated by Douglas fir, 40 percent sagebrush/grass, and 20 percent lodgepole pine/Douglas fir fuel type. The area contains a "cultural mining district" which requires special protection of historical values. This area is also part of a Forest Service Landscape Plan. The area includes approximately 264,400 acres (5 percent BLM, 17 percent private, and 78 percent FS).

Wildland fire history: Between 1978 and 1999, federal agencies responded to 47 fires which burned an estimated 55 acres. Average fire size was 1.2 acres.

Intermix: Numerous subdivisions and homes occur on adjoining land near the town of Boulder and the High Ore Mine area. This area is in Jefferson County. It has medium population density; medium escaped fire potential; medium potential for loss of life or property; medium community support; and medium community safe efforts. There is interspersed private land with logging and mining activities.

Area concerns and constraints: Unplanned fire is likely to damage property. Subdivisions have created an intermix which limits opportunities for modified suppression. The historic mining district also limits suppression and prescribed fire opportunities. The presence of a Bonneville Power Administration (BPA) power line affects fire suppression tactics. Open mine shafts, air vents, and large collapsed slopes should be avoided.

Resource objectives: Reduce conifer colonization and achieve desired vegetative communities.

Fire objectives: Unplanned fire is not desired due to the intermix with Boulder, the High Ore Mine area, and other developments. The appropriate management response to wildland fire would be aggressive fire suppression. Prescribed fire and other fuels management strategies may be appropriate to reduce fuels buildup and to avoid or mitigate the effects of potential wildland fires. The use of fire would be limited as a management tool due to intermix with subdivisions and the historical mining district. Fire may be used to limit timber encroachment into sagebrush/grass communities; to open willow, conifer woodlands and aspen stands; and to improve age structure and stand vitality.

Wildland fire suppression and rehabilitation: Confine or contain unplanned ignitions to less than 200 acres.

Prescribed fires and other fuels management: Prescribed fires could be used to improve age structure and stand vitality. Mechanical treatments may also be required to reduce heavy fuel loading.

SPOKANE HILLS AND NORTH (B15)

Area description: This area is characterized by a scattered land pattern with numerous subdivisions. It is predominately a ponderosa pine/grass fuel type. The area includes approximately 151,000 acres (4 percent BLM, 6 percent state, and 90 percent private).

Wildland fire history: Much of this area burned in 2000. Federal agencies responded to 18 fires which burned an estimated 435 acres. Average fire size was 24.2 acres.

Intermix: This area contains scattered subdivisions with medium population density. Much of this area burned in a 2000 wildland fire. The type and amount of future revegetation will determine the escaped fire potential and potential for loss of life or property.

Area concerns and constraints: Access to public land is difficult due to steep terrain and surrounding private land. Subdivisions limit opportunities for modified suppression and increase the potential impacts of smoke.

Resource objectives: Rehabilitate the area following wildland fire to stabilize soils, reestablish vegetation, and minimize soil loss and water pollution.

Fire objectives: Fire is not desired in this area due to the interface with subdivisions and other developments. The appropriate management response to wildland fire within the Spokane Hills and North area would be aggressive fire suppression. Prescribed fire and other fuels management strategies may be appropriate to reduce fuels buildup and to

avoid or mitigate the effects of potential wildland fires in the future.

ABSAROKA FOOTHILLS (C1)

Area description: This area is on the western fringe of the Absaroka Mountain Range. It contains approximately 50 percent Douglas fir fuel type and 50 percent sagebrush/grass fuel type. The area includes approximately 67,700 acres (6 percent BLM, 3 percent state, 52 percent private, and 39 percent FS).

Wildland fire history: Between 1978 and 1999, federal agencies responded to four fires which burned an estimated 80 acres. Average fire size was 20 acres.

Interface: Some subdivisions exist, primarily in the Paradise Valley area. Paradise Valley is south of Livingston in Park County. It has medium population density; low escaped fire potential; low potential for loss of life or property; medium community support; and low community safe efforts.

Area concerns and constraints: Fire management opportunities are limited by poor access and the small size of BLM-administered tracts in the area.

Resource objectives: Manage native vegetation to meet standards for rangeland and forest health. Maintain stable soils and sustain current land uses. Sagebrush habitats, especially those in identified sage grouse nesting and wintering areas and big game concentration areas should be maintained to the maximum extent possible.

Fire objectives: Carefully managed wildland fire, subject to constraints, may help manage the ecosystem. Prescribed fire/other methods may be used to help meet the adjacent Forest Service Landscape Management objectives and to reduce hazardous fuels buildup where conifers have encroached into sagebrush parks.

BIG BELT MOUNTAINS (C2)

Area description: This area is on the fringe of the Big Belt Mountains and consists primarily of ponderosa pine fuel types at the lower elevations. Douglas fir occurs in drainages and on northern aspects. The area includes approximately 328,000 acres (1 percent BLM, 23 percent private, and 76 percent FS).

Wildland fire history: Between 1978 and 1999, federal agencies responded to 106 fires which burned an estimated 630 acres. Average fire size was 5.9 acres.

Intermix: This area contains a few isolated ranches and farms.

Area concerns and constraints: Fire management is influenced by transitional big game winter range, adjoining private lands, and the Forest Service Landscape Plan.

Resource objectives: Manage native vegetation to meet standards for rangeland and forest health. Maintain stable soils and sustain current land uses. Sagebrush habitats, especially those in big game concentration areas should be maintained to the maximum extent possible.

Fire objectives: Wildland fire, subject to the constraints listed above, may be desired to help manage the ecosystem. Prescribed fire/other methods may be used to reduce hazardous fuels and to limit encroachment of Douglas fir and ponderosa pine into the sagebrush/grass parks and to open up and revitalize aspen stands where appropriate.

CLANCY/MARYSVILLE (C6)

Area description: This area contains very scattered and mixed ownership. Fuel types vary from high elevation conifers to sagebrush/grass communities. There are numerous subdivisions throughout the area. The Marysville area, in Lewis and Clark County, contains heavy coniferous commercial forests of lodgepole pine and Douglas fir which are overstocked. This timber is in the 100 year age class. The area also contains a ski area and a historic mining district. The area includes approximately 269,000 acres (10 percent BLM, 1 percent state, 44 percent private, and 45 percent FS).

Wildland fire history: Between 1978 and 1999, federal agencies responded to 149 fires which burned an estimated 426 acres. Average fire size was 2.9 acres.

Intermix: Subdivisions are prevalent throughout the Clancy and Marysville areas. The Great Divide Ski Area with numerous structures is also present within this polygon. The Divide-Marysville area near Helena contains some areas with high density of homes and roads. It has high population density; escaped fire potential is medium; potential for escaped fire is medium; potential for loss of life or property is high; and community support and community safe efforts are considered high.

Area concerns and constraints: Interface with subdivisions and other private developments will limit opportunities for modified suppression of wildfires. The Marysville historic mining district limits the use of heavy equipment.

The Great Divide Ski Area also limits suppression options and the use of heavy equipment. Avoidance of open mine shafts, air vents, and large collapsed stopes will be required during fire suppression operations.

Resource objectives: Protect urban interface areas, ski area, and historical resources. Reduce hazardous fuel areas with prescribed fire and mechanical treatments.

Fire objectives: Carefully managed wildland fire, subject to the constraints listed above, may be desired to help manage the ecosystem. Fire/other methods may be used to adjust age structure of the 100 year old timber stands and to reduce hazardous fuel buildup where public lands interface with subdivisions and other developments.

Prescribed fires and other fuels management: Prescribed fires/other methods may be used to adjust the age structure of heavy coniferous commercial forest of lodgepole pine and Douglas fir which are overstocked and in the 100 year age class communities.

ELKHORN MOUNTAINS (C7)

Area description: The area consists of the South Elkhorns, the North Elkhorns, and Crow Creek management units. The area contains approximately 50 percent sagebrush/grassland fuel type, 30 percent woodland transition-mixed juniper, limber pine, an Douglas fir, and 20 percent Douglas fir/lodgepole pine and ponderosa pine fuel type. Smaller area of alpine timber also occur at higher elevations. Conifers are generally overstocked from past fire exclusion and are encroaching into sagebrush/grass areas. Conifer communities are about 100 years old and lack diversity of age classes. Many areas of aspen and willow are disappearing due to conifer encroachment. The area includes approximately 472,000 acres (14 percent BLM, 3 percent state, 49 percent private, and 34 percent FS).

Wildland fire history: Between 1978 and 1999, federal agencies responded to 168 fires which burned an estimated 55,020 acres. Average fire size was 327.5 acres.

Interface/intermix: Some isolated homes and ranches occur on adjoining land. Subdivisions are present on the north end of the Elkhorn Mountain Range.

Area concerns and constraints: Management should complement Forest Service objectives within the Landscape Plan. Adjoining private land may limit fire management opportunities. Close coordination with adjoining landowners is necessary. Urban interface in the North Elkhorns near Helena and Clancy limits suppression

opportunities and makes prescribed fire management difficult. Much of the area should be treated mechanically prior to burning due to heavy fuel loading. The Elkhorns Tack on WSA precludes use of mechanical equipment. The presence of (BPA) powerlines complicates suppression efforts.

Resource objectives: Reduce conifer encroachment into sagebrush/grass parklands and foothills to improve habitat for elk and deer. Reduce excess fuels buildup in woodland habitat by managing naturally occurring fire to achieve resource objectives. Be consistent with the Elkhorns Fire Management Plan.

Fire objective: Wildland fire, subject to constraints, may be desired to help manage the ecosystem. Fire/other methods may be used to open the closed timber stands to promote a diversity of age structure and return sites to a more open savannah type. Fire may be used to reduce conifer encroachment into willow and aspen communities. Big game winter range may be maintained or improved by using fire to keep sites palatable for winter forage by rejuvenating grasses, big sagebrush, mountain mahogany and bitterbrush and limiting conifer encroachment.

Wildland fire suppression and rehabilitation:

Cultural: The Elkhorn Townsite Historic District and the Golconda Creek Historic District will be protected from wildfire.

Special areas and wilderness study areas: There are several areas within the Elkhorn Mountains, including the Elk Horn Mountain WSA, that receive special attention. See guidance for wildland fire suppression and rehabilitation within WSAs. These areas have high resource values including cultural, relic, vegetation, high visual and scenic values and/or historic attributes. A Resource Advisor shall assist the Incident Commander in making suppression decisions. Intensive fire suppression techniques, especially the use of heavy equipment, shall be carefully analyzed prior to being committed.

Prescribed fires and other fuels management: Prescribed fire and other methods may be used to reduce fuels buildups and meet other resource objectives. Prescribed fires may be used to open dense conifer stands and reduce conifer encroachment into sagebrush/grass parks and foothills. Prescribed fire activity will be curtailed if burn target is reached through planned and unplanned ignitions. Mechanical treatments may be required prior to burning due to heavy fuel loadings. Priority will be given to projects within Wildlife Habitat Management Unit 36.

FLEECER MOUNTAINS (C8)

Area description: Approximately 40 percent of the area is sagebrush/grass fuel type and 50 percent is woodland transitional forest dominated by Douglas fir. About 5-10 percent of this forest type also includes lodgepole pine and spruce. Mountain mahogany occurs on rocky areas and is present on about 10 percent of the area. The area includes 284,000 acres (6 percent BLM, 2 percent state, 55 percent private, and 37 percent FS).

Wildland fire history: Between 1978 and 1999, federal agencies responded to 67 fires which burned an estimated 225 acres. Average fire size was 3.3 acres.

Interface/Intermix: Isolated homes and ranches are present within the area.

Area concerns and constraints: The combination of steep topography and proximity to the highway and private land limits suppression options. Poor access limits opportunities for suppression and prescribed fire activities in the steep/rocky mountain mahogany areas. Use of mechanized equipment is limited within the watershed of the Big Hole River to protect critical habitat for the Arctic Grayling. The BPA powerline through the area also limits suppression efforts.

Resource objectives: Reduce conifer encroachment into sagebrush/grass parklands and foothills to maintain/enhance winter range for elk and mule deer. Fires within one mile of the Big Hole River should be immediately suppressed to protect the visual quality of the river corridor.

Fire objective: Fire, subject to the constraints listed above, may be desired to help manage the ecosystem. Use fire/other methods to limit the encroachment of Douglas fir into sagebrush/grass parks. Fire may be used to open stands of aspen to encourage reproduction and improve the health of these communities. Fire may be used to revitalize mountain mahogany communities.

Wildland fire suppression and rehabilitation:

Riparian areas and fisheries habitat: See Appendix A for guidance concerning Special Status species habitat such as the Big Hole River and its tributaries. All Arctic Grayling habitat would be protected.

Prescribed Fire and Other Fuels Management: Prescribed fire may be used to reduce fuels buildup and to meet other resource objectives. Prescribed fires may be used to limit encroachment of Douglas fir into sagebrush/grass parks, to improve the health of aspen stands, and to revitalize mountain mahogany.

MCCARTNEY/ROCHESTER (C10)

See Dillon Field Office

PIPESTONE (C12)

Area description: About 40 percent of the area contains sagebrush/grass fuel types; another 40 percent is dominated by either transitional or true timber fuel types made up primarily of Douglas fir. About 10 percent of the area consists of large boulder fields. There are also large areas of south facing mountain mahogany stands. The area includes 369,300 acres (11 percent BLM, 4 percent state, 46 percent private, and 39 percent FS).

Wildland fire history: Between 1978 and 1999, federal agencies responded to 108 fires which burned an estimated 1,624 acres. Average fire size was 15 acres.

Intermix: Subdivisions are present in the Toll Mountain and Pipestone areas. These are near Whitehall in Jefferson County. They are characterized by medium population density; medium escaped fire potential; medium potential for loss of life or property; medium community support; and low community safe efforts.

Area concerns and constraints: Subdivisions make fire management more difficult. Highly erosive soils contribute heavy sediment loads within the watershed, particularly if heavy equipment is used.

Resource objectives: Manage native vegetation to meet standards for rangeland health. Maintain stable soils and sustain current land uses. Sagebrush habitats, especially those in identified sage grouse nesting and wintering areas and big game concentration areas should be maintained to the maximum extent possible.

Fire objectives: Fire, subject to the constraints listed above, may be desired to help manage the ecosystem. Fire may be used to enhance big game winter range and reduce hazardous fuels in interface areas.

SLEEPING GIANT/SHEEP CREEK (C14)

Area description: This area contains the Sleeping Giant/Sheep Creek WSA (10,597 acres), and the Sleeping Giant ACEC (11,609 acres). It is characterized by steep, rugged topography with numerous rock outcroppings. Approximately 50 percent of the area is forested with Douglas fir, ponderosa pine, lodgepole pine, and limber pine being the major species. The remainder of the area contains open

grasslands, rock outcroppings, and talus slopes. Approximately 2000 acres contain substantial amounts of overstory Douglas fir/pine mortality where 25-50 percent is dead. Land ownership in the area is 95 percent BLM, and 5 percent state.

Wildland fire history: Between 1978 and 1999, federal agencies responded to six fires which burned about three acres. Average fire size was about .5 acres.

Interface: No interface areas are present within this area.

Area concerns and constraints: Suppression actions should be done in a manner that least impairs wilderness characteristics in the Sleeping Giant/Sheep Creek WSA. The area also contains the Sleeping Giant ACEC, which was designated for dispersed recreation opportunities, natural scenic qualities, and high value wildlife habitat. Use of mechanized equipment is limited due to the Wilderness Study Area (WSA) designation. Fire control is difficult due to poor access and steep terrain. Surrounding private lands also need to be considered.

Resource objectives: Maintain the natural and visual qualities of these specially designated areas.

Fire objective: Fire, subject to the constraints listed above, may be desired to help manage the ecosystem. Prescribed fire may be used only after very careful consideration and planning to open up encroached areas of timber and restore ponderosa pine savannah communities, in order to improve habitat for priority native wildlife species. No fires are desired in portions of the Sleeping Giant WSA within the viewsheds seen from the Missouri River.

Wildland fire suppression and rehabilitation: Use of mechanized equipment is limited due to the WSA designation. Full suppression should be used when fuel release potentials are high to extreme. See guidance for wildland fire suppression and rehabilitation within WSAs.

Forestry: Salvage harvest of forest products would be considered outside of WSAs.

Prescribed fires and other fuels management: Use prescribed fire to improve habitat for priority native wildlife species by opening up encroached areas of timber to restore ponderosa pine savannah communities. See guidance for use of prescribed fire within WSAs.

THREE FORKS (C16)

Area description: This area is predominately a juniper/limber pine/grassland fuel type. The Horseshoe area

contains commercial Douglas fir fuel types. The Black Sage WSA is located in the northwestern part of the area. The area includes approximately 356,000 acres (8 percent BLM, 5 percent state, and 87 percent private).

Wildland fire history: Between 1978 and 1999, federal agencies responded to 16 fires which burned an estimated 514 acres. Average fire size was 32.1 acres.

Interface/intermix: Some isolated homes and ranches are present in this area.

Area concerns and constraints: Adjoining private lands make access and modified suppression activities difficult. Use of mechanical equipment is limited in the Black Sage WSA and minimal impact suppression methods would be applied. Avoidance of open mine shafts, air vents, and large collapsed stopes would be required during fire suppression operations.

Resource objectives: Manage native vegetation to meet standards for rangeland and forest health. Maintain stable soils and sustain current land uses. Sagebrush habitats, especially those in identified sage grouse nesting and wintering areas and big game concentration areas should be maintained to the maximum extent possible.

Fire objectives: Fire, subject to the constraints listed above, may be desired to help manage the ecosystem. Prescribed fire/other methods may be used on the western portion of the area to limit encroachment of Douglas fir and juniper into the sagebrush/grass areas.

Wildland fire suppression and rehabilitation:

Special areas and wilderness study areas: There are several areas within the Three Forks area that receive special attention. See guidance for wildland fire suppression and rehabilitation within WSAs. These areas have high resource values including cultural, relic, vegetation, high visual and scenic values and/or historic attributes. A Resource Advisor shall assist the Incident Commander in making suppression decisions. Intensive fire suppression techniques, especially the use of heavy equipment, shall be carefully analyzed prior to being committed.

Visual resources: Fire rehabilitation of WSAs should be coordinated with the Field Office VRM specialist and protected as much as possible.

Prescribed fires and other fuels management: Prescribed fires/other methods may be used to limit encroachment of Douglas fir and juniper into sagebrush/grass areas.

APPENDIX D

DILLON FIELD OFFICE FIRE MANAGEMENT PLAN

Background The Dillon Field Office is located in the southwestern corner of Montana. It includes approximately 910,000 acres of BLM lands. Grasslands and shrubs are the most common landcover categories. About 280,300 acres or 31 percent of the public lands are considered grasslands. About 440,500 acres or 48 percent of the public lands are considered shrublands. About 168,800 acres or 19 percent of the public lands are considered forestlands. About 4,400 acres or less than 1 percent of the public lands are considered riparian areas. The remainder of the area is made up of barren areas such as exposed rock or badlands.

The Dillon Field Office contains 17 fire management zones. It also contains ten WSAs (Ruby Mountains, Blacktail Mountains, East Fork Blacktail Deer Creek, Hidden Pasture Creek, Bell/Limekiln Canyons, Henneberry Ridge, Farlin Creek, Axolotl Lakes, Centennial Mountains, and Tobacco Root Tack on (Section 202)), and one WA (Bear Trap Canyon). (See Map 5.)

Planning guidance The Dillon Management Framework Plan (MFP) (1980) will be updated as necessary to incorporate the fire management planning objectives and guidance contained in this document and described below.

Wildland fire suppression and rehabilitation guidance common to all areas within the Dillon Field Office boundaries: In addition to the state guidelines found in Appendix A, the following resources or values will be given further consideration as specified.

Cultural- Appropriate management responses to wildland fire on or near known cultural sites could include aerial application of fire retardant (in areas where no rock art is present), conditional fireline tactics such as the use of natural barriers, hand constructed fireline and other minimum suppression tactics. Use of earth moving equipment would be considered on a case-by-case basis. This process will consider resource values that could be affected, expected fire behavior and how these affect the escape fire analysis. Staging areas and fire camps would be placed outside these areas wherever possible. A Resource Advisor will be on-site during project scale wildland fire suppression and rehabilitation efforts to insure compliance with the decisions and guidelines for the following areas nominated as ACECs for cultural values: Maiden Rock-Soap Gulch- Camp Creek; Badger Gulch- Bannack Historic District; Clark Canyon; Ferruginous Hawk Nest Areas in the Sweetwater Basin Area; Virginia City Historic District; Axolotl Lakes; Madison River Corridor; East

Fork of the Blacktail; Sage Creek, Everson Creek; Muddy Creek-Big Sheep Creek; Lima Reservoir; Centennial Mountains and the Upper Centennial Basin Bald Eagle Nest Areas.

Prescribed fire and other fuels management guidance common to all areas within the Dillon Field Office boundaries: The following resources or values will be given consideration in addition to the guidance found in Appendix A. Prescribed fire may be a management tool to be used on some BLM tracts to reach vegetation management objectives. Specific use of prescribed fire will be analyzed on a site specific basis through the NEPA process.

BEAVERHEAD/JEFFERSON (A2) AND MADISON VALLEY (A10)

Area description: The Beaverhead/Jefferson area is a corridor of private agricultural land along the Beaverhead and Jefferson rivers. The area includes approximately 937,524 acres (4 percent BLM, 11 percent state, and 85 percent private).

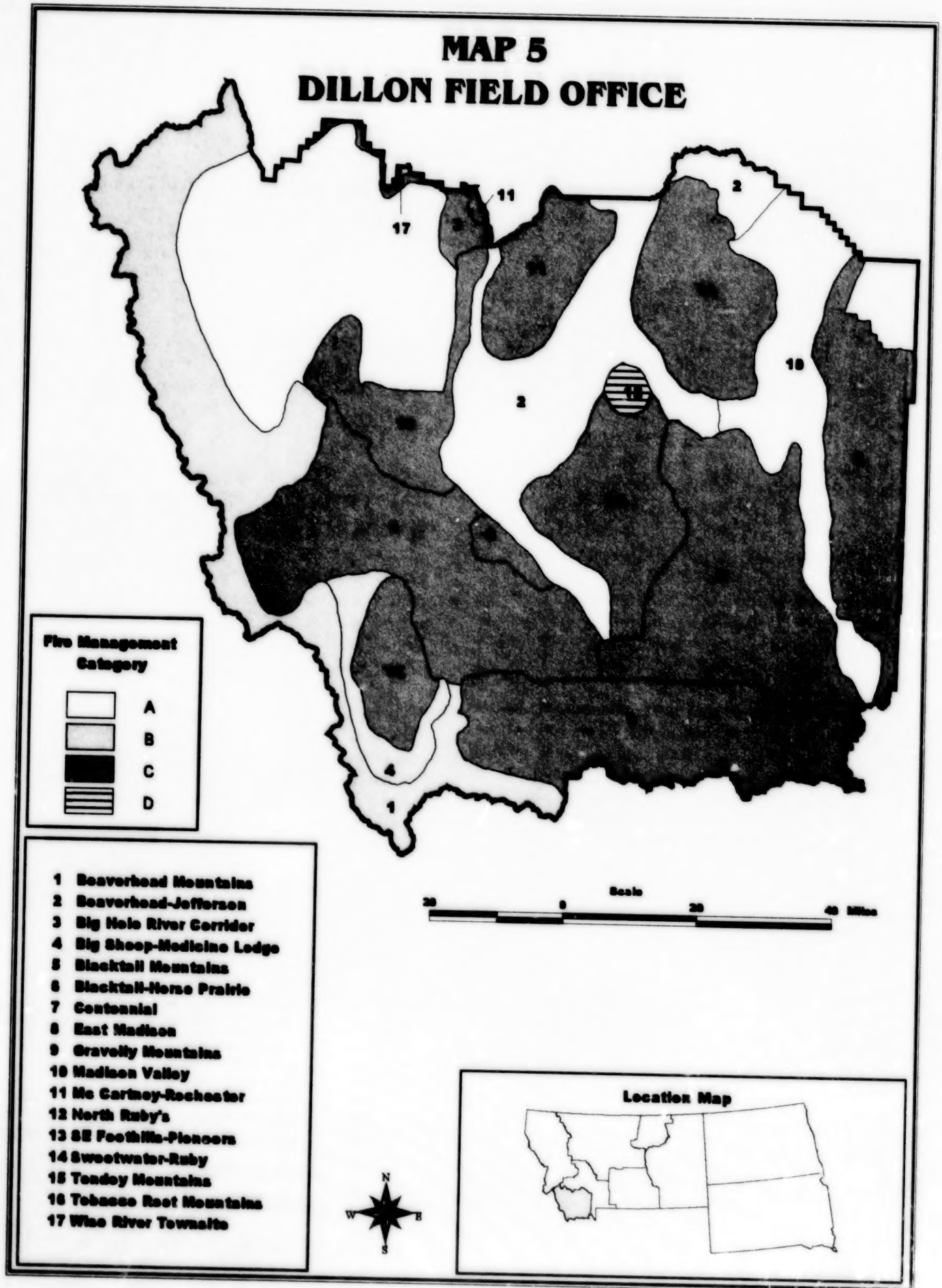
Wildland fire history: Between 1980 and 1999, federal agencies responded to 25 fires in the Beaverhead/Jefferson area which burned an estimated 4,568 acres. Average fire size was 182.7 acres. Federal agencies have responded to 33 fires in the Madison Valley which burned an estimated 5,960 acres. Average fire size was 180 acres.

Interface: The majority of the population base of Beaverhead and Madison Counties lives within these areas. A large percentage of Beaverhead River drainage is irrigated for agricultural crops. As a result, wildfire risk is normally low during the growing season. Some portions of the Madison River drainage are also irrigated for crops, but it contains more dry land areas susceptible to wildfire. It also has a rapidly growing urban interface. However, no priority interface areas with hazardous fuels buildup on public lands have been identified in this area.

Area concerns and constraints: Fire is generally not desired due to large amounts of private land and rural subdivisions.

Fire objective: Wildland fire is not desired due to large amount of private land and agricultural production along the Beaverhead and Jefferson rivers.

MAP 5 DILLON FIELD OFFICE



WISE RIVER TOWNSITE (B17)

See Wise River Townsite description for the Butte Field Office

BEAVERHEAD MOUNTAINS (B1)

Area description: This area runs along the Continental Divide and contains primarily high elevation heavy conifer fuel types. The area includes approximately 743,328 acres (4 percent BLM, 2 percent state, 10 percent private, and 84 percent FS). BLM lands constitute a minor amount of Federal ownership along the west side of the Big Hole Valley.

Wildland fire history: Between 1980 and 1999, federal agencies responded to 90 fires which burned an estimated 320 acres. Average fire size was 3.5 acres.

Interface: The towns of Wisdom and Jackson are the main concentrations of housing and are in defendable areas from wildfire. The remainder of the area is sparsely populated with isolated ranch operations and associated out buildings. Typical urban interface situations are uncommon. No priority interface areas with hazardous fuels buildup on public lands have been identified in this area.

Area concerns and constraints: Unplanned fire is likely to cause negative effects. High recreation use due to Continental Divide Trail, contains a Scenic Byway, and it is a wildlife migration corridor which provides important security and hiding cover. This entire area provides potential/occupied lynx habitat. The lynx Conservation Strategy may modify or constrain salvage harvest and/or prescribed fire to protect lynx denning habitat.

Resource objectives: Restore and maintain healthy forest ecosystems with stocking density control.

Fire objectives: The use of fire as a management tool would primarily be designed to reach vegetation management objectives described above. Unplanned fire is likely to cause negative effects. Prescribed fire and other fuels management may be used to avoid or mitigate adverse impacts of wildland fire.

BIGSHEEP/MEDICINE LODGE BACK COUNTRY BYWAY (B4)

Area description: This area is primarily a sagebrush/grass fuel type. The area includes approximately 96,125 acres (48 percent BLM, 6 percent state, 4 percent private, and 5 percent FS).

Wildland fire history: Between 1980 and 1999, federal agencies responded to 14 fires which burned an estimated 3,720 acres. Average fire size was 266 acres.

Interface: Interface areas are mostly scattered ranches and associated structures. The Medicine Lodge interface area is really two separate low priority interface areas with hazardous fuels buildup on public lands. They have low population density, low escaped fire potential, low to medium potential for loss of life or property from wildland fire, and relatively low community support for treating hazardous fuels.

Area concerns and constraints: Unplanned fire is likely to cause negative effects. This area contains high levels of public use for recreation and a large amount of private land.

Resource objectives: Maintain healthy grass/sagebrush plant community.

Fire objectives: Limit the use of fire as a management tool due to limited BLM ownership and heavy recreation use. Unplanned wildland fire is likely to cause negative effects. Prescribed fire and other fuels management may be used to avoid or mitigate adverse impacts of wildland fire.

CENTENNIAL (C7)

Area description: This area consists of open sagebrush/grass with numerous wetlands. The south end contains dense stands of conifers to the Continental Divide. North end is sagebrush dominated foothills. Frequent past fires have reduced sagebrush canopy cover in key winter range areas. The area includes approximately 505,750 acres (27 percent BLM, 17 percent state, 38 percent private, 7 percent National Wildlife Refuge, and 9 percent FS). It also contains the Centennial Mountains WSA (27,691 acres) which accounts for about one fifth of the BLM acreage in this fire management area.

Wildland fire history: Federal agencies responded to 41 fires which burned more than 7,800 acres. Average fire size was 190 acres. Between 1980 and 1998 BLM responded to 10 fires that averaged about 410 acres.

Interface: Communities include Dell, Lima, Monida and Lakeview. There are also ranches and outbuildings scattered throughout the area. Two priority interface areas with hazardous fuels buildup on public lands are Lakeview and Alaska Basin. Lakeview is considered to have medium population density, low to medium escaped fire potential, low potential for loss of life or property, and medium community support for treating hazardous fuels. Alaska Basin has low population density, medium escaped fire

potential, low potential for loss of life or property, and community support for reducing hazardous fuels is unknown.

Area concerns and constraints: Loss of livestock forage on adjoining private land, cultural concerns, implementation of the Gravelly Landscape Plan, and coordination with Red Rock Refuge. This unit supports significant wildlife use on seasonal habitat and migrational corridors. The Centennial Mountains provide potential/occupied lynx habitat. The lynx Conservation Strategy may modify or constrain salvage harvest and/or prescribed fire to protect lynx denning habitat. Significant interstate movement of sage grouse, elk, wolverine, grizzly bear and wolf through this area emphasizes the need to maintain seasonal habitat and travel corridors. Sagebrush habitat has been substantially fragmented by private land vegetation treatments.

Resource objectives: Resource objects are to maintain healthy grass/sagebrush communities in the non-forested areas. In the forested portion of the Centennial Mountains, restore forest health conditions as outlined in the Gravelly Landscape Analysis (GLA). Specifically, the GLA stated that 700 acres of aspen should be restored, and the drier Douglas fir habitat types should be restored to a savannah structure. In areas of extensive lodgepole pine, fire should be the primary means of establishing age class mix. In areas of subalpine fir, treatment should emphasize areas where there is enough lodgepole pine intermixed to restore earlier seral conditions or where there is sufficient whitebark pine seed source to re-establish this important species.

Fire objective: Fire, subject to the constraints listed above, is desired to help manage the ecosystem. Fire/other methods may be used to open dense timber stands in the southern portion to move succession back to an early seral stage with increased aspen growth and to reduce conifers in riparian areas. Limit fire in the north portion of the valley to protect crucial sagebrush winter range.

BLACKTAIL MOUNTAINS (C5)

Area description: Approximately half the area consists of dense conifer stands at the upper elevations. The other half is a sagebrush/grass fuel type. The area includes approximately 34,564 acres (62 percent BLM, 13 percent state, and 25 percent private). The Blacktail Mountains WSA (17,497 acres) makes up about 80 percent of the BLM acreage in this Fire Management Area.

Wildland fire history: Between 1980 and 1999, federal agencies responded to eight fires which burned an estimated 350 acres. Average fire size was 43.7 acres.

Interface: There is one ranch and several "cow camps" and outbuildings in the area. No interface areas with hazardous fuels buildup on public lands were identified as a priority.

Resource objectives: Mechanical forest management treatments are incompatible with WSA policy guidance. Low intensity fire (either unplanned or planned ignition) may be used to reduce current stocking levels of overcrowded conifer stands and re-establish earlier seral conditions. The Blacktail Mountains are part of a larger area identified in the GLA. Resource and fire objectives for grass/sagebrush are addressed in the Blacktail/Horse Prairie section.

Fire objective: Fire, subject to the constraints listed above, is desired to help manage the ecosystem. Fire/other methods may be used to open the canopy of dense stands of conifers and to reestablish an earlier seral stage. Fire may be used at the conifer/sagebrush interface to reduce encroachment of young conifers into sagebrush on approximately 1,500 acres/year. Fire may be used on up to 300 acres to restore decadent aspen stands to earlier successional stages and reintroduce Douglas fir savannah structures.

TENDROY MOUNTAINS (C15)

Area description: Approximately 70 percent of the area is sagebrush/grass fuel type. The other 30 percent of the area has dense conifers. The area includes approximately 135,800 acres (41 percent BLM, 3 percent state, 8 percent private, 48 percent FS). Hidden Pasture Creek WSA (15,509 acres) and Bell/Limekiln Canyon WSA (9,650 acres) account for about 45 percent of the BLM acreage.

Wildland fire history: From 1978 to 1999, federal agencies have responded to 13 fires which burned an estimated 56 acres. Average fire size was 4.3 acres.

Interface: There are several ranches and outbuildings scattered throughout the area. No interface areas with hazardous fuels buildup on public lands were identified as a priority.

Area concerns and constraints: Protect remnant stands of Mountain Mahogany, protect scenic byway on west and south ends. Portions of the Tendoy Mountains provide potential/occupied lynx habitat. The lynx Conservation Strategy may modify or constrain salvage harvest and/or prescribed fire to protect lynx denning habitat. The presence of major elk winter and calving ranges, and sage grouse breeding complexes and winter habitat emphasize the need to protect sagebrush habitat and security cover.

Resource objectives: Maintain healthy grass/sagebrush communities and restore forest health conditions in the Tendency Mountains.

Fire objective: Fire, subject to the constraints listed above, may be desired to help manage the ecosystem. Fire/other methods may be used on up to 500 acres to maintain the current interspersed of habitat types. Fire is desirable to restore Aspen and Bitterbrush communities.

BLACKTAIL/HORSE PRAIRIE (C6)

Area description: This area is primarily an open sagebrush/grass fuel type. It contains small isolated timber stands in low to mid elevation foothills. The area includes approximately 663,700 acres (41 percent BLM, 19 percent state, 39 percent private, 1 percent FS). The Henneberry Ridge WSA (9,806 acres) accounts for less than five percent of the BLM acreage.

Wildland fire history: From 1978 to 1999, federal agencies have responded to 26 fires which burned an estimated 14,300 acres. Average fire size was 548 acres. An estimated 5 percent of the area has burned since the early 1980s.

Interface: The town of Grant contains the main concentrations of housing and is in a defendable area from wildfire. The town has low population density, escaped fire potential is considered low, and the potential for loss of life or property is considered low. Community support for hazardous fuels reduction actions is considered low. The remainder of the area is sparsely populated with isolated ranch operations and associated outbuildings. Interface situations are uncommon. Donovan Ranch was identified as an interface area with low population density, low potential for escaped fire, and low potential for loss of life or property. Community support for actions to reduce hazardous fuels is unknown.

Area concerns and constraints: Adjoining private lands limit fire management opportunities and require close coordination and consultation with landowners. The Horse Prairie area supports several major sage grouse breeding complexes, antelope and elk winter habitat. Sagebrush habitats also support several sensitive sagebrush-dependant species. Significant areas of sagebrush habitat have been fragmented, modified or converted by vegetation treatments. Areas adjoining Beaverhead-Deerlodge National Forest provide potential/occupied lynx habitat. The lynx Conservation Strategy may modify or constrain salvage harvest and/or prescribed fire to protect lynx denning habitat.

Resource objectives: Maintain existing grass/sagebrush cover on public lands. Arrest the loss of this habitat to Douglas fir encroachment where it interfaces with Douglas fir habitat types on sagebrush lands east of Interstate 15.

Fire objectives: Fire, subject to the constraints listed above, may be used to help manage the ecosystem. Protect sagebrush communities due to high diversity of sagebrush-dependant wildlife species.

SWEETWATER/RUBY (C14)

Area description: Approximately 70 percent of this area is sagebrush/grass fuel type. The remaining 30 percent consists of mixed conifer fuel type. The area includes approximately 326,900 acres (27 percent BLM, 18 percent state, 54 percent private, 1 percent FS). The East Fork Blacktail Deer Creek WSA (6,230 acres) accounts for about seven percent of the BLM acreage.

Wildland fire history: From 1978 to 1999, federal agencies have responded to 26 fires which burned an estimated 8,400 acres. Average fire size was 321.5 acres. An estimated 25 percent of the sagebrush areas have burned since the early 1980s.

Interface: The area is sparsely populated with isolated ranch operations and associated outbuildings. Interface situations are uncommon. No interface areas with hazardous fuels buildup on public lands were identified as a priority.

Area concerns and constraints: Limit fire in sagebrush areas not being affected by Douglas fir encroachment. Limit wildfire on the Blacktail Game Range in the southeast portion of the area. Sagebrush habitats supporting sage grouse breeding complexes, and sage grouse and antelope seasonal use have been fragmented and modified by vegetation treatments in Sweetwater Basin.

Resource objectives: Limit additional wildland and prescribed fire in the grass/sagebrush vegetation type on public lands for the next five years. Use of fire in the conifer vegetation types as opportunities permit would be beneficial by creating earlier seral conditions in these stands. NOTE: Gravelly Landscape Analysis objectives across all public lands in the Ruby Mountains recommended treating 400 acres of aspen, 6,600 acres of sagebrush/year, and 1,000 acres of grass, all over 10 years.

Fire objectives: Fire, subject to the constraints listed above, may be desired to help manage the ecosystem. Protect sagebrush communities due to high diversity of

sagebrush-dependant wildlife species. Limit the amount of fire on public grasslands (primarily composed of sagebrush) due to past fires and sagebrush control on private and public lands.

TOBACCO ROOT MOUNTAINS (C16)

Area description: Public lands in this unit are primarily on the outside fringe of the Tobacco Root Mountain Range. Approximately 50 percent of this area is sagebrush/grass fuel type. The remaining 50 percent consists of mixed conifer fuel type. The area includes approximately 296,200 acres (11 percent BLM, 2 percent state, 30 percent private, 57 percent FS). The tobacco root tack-on (Section 202) WSA contains 860 acres which accounts for less than 3 percent of the BLM acreage.

Wildland fire history: From 1978 to 1999, federal agencies have responded to 42 fires which burned an estimated 1,800 acres. Average fire size was 42.5 acres.

Intermix: The town of Pony and growing subdivisions are relatively common along the east and southern flanks of the Tobacco Root Mountains. These are commonly intermixed with public lands. Interface is also increasing on private lands along the the Tobacco Root Mountains. South Meadow Creek and Strawberry Ridge are interface areas near the Tobacco Root Mountains. South Meadow Creek is considered to have low population density, medium escaped fire potential, low potential for loss of life or property, and medium level of community support for hazardous fuel reduction actions. Strawberry Ridge is considered to have low population density, low to medium escaped fire potential, low potential for loss of life or property, and medium level of community support for hazardous fuel reduction actions.

Area concerns and constraints: Limit fire along the south and east borders due to development of subdivisions. Major elk and mule deer winter habitat surrounds much of this unit on public and private lands. Maintaining seasonal habitats and security cover is a concern. Portions of the Tobacco Root Mountains provide potential/occupied lynx habitat. The lynx Conservation Strategy may modify or constrain salvage harvest and or prescribed fire to protect lynx denning habitat.

Resource objectives: Reintroduction of fire is desired along the west flank of the Tobacco Root Mountains where Rocky Mountain Juniper and Douglas fir are encroaching and beginning to dominate both riparian areas and former grass/sagebrush areas. Forest health issues such as overstocked stands and associated loss of vigor would also be rectified by use of mechanical thinning and recycling of nutrients by fire.

Fire objectives: Fire, subject to the constraints listed above, may be desired to help manage the ecosystem. Fire/ other methods may be used to restore dense timber stands to earlier seral stages and to open dense juniper stands, particularly in riparian areas.

GRAVELLY MOUNTAINS (C9)

Area description: Public lands in this unit are primarily on the Northern fringe of the Gravelly Mountain Range. Approximately 30 percent of this area is sagebrush/grass fuel type. The remaining 70 percent consists of mixed conifer fuel type. The area includes approximately 626,600 acres (6 percent BLM, 3 percent state, 14 percent private, 77 percent FS). The Axolotl Lakes WSA (7,804 acres) accounts for about one-fifth of the BLM acreage.

Wildland fire history: From 1978 to 1999, federal agencies have responded to 52 fires which burned an estimated 1,500 acres. Average fire size was 28.3 acres.

Intermix: The Alder Gulch Historic Mining District lies in the area's northern portion and there is increasing subdivision activity along the eastern portion of the area. Summ: Alder Gulch is considered to have medium to high population density, low to high escaped fire potential, low to medium potential for loss of life or property, and medium level of community support for hazardous fuel reduction actions.

Area concerns and constraints: These areas could be difficult to defend in a major wildfire event due to the prevailing wind direction. Significant elk and mule deer seasonal habitat and winter ranges occur in this unit, along with increasing use by grizzly bear and wolf. Locations of game ranges and winter sagebrush habitat. Areas adjoining Beaverhead-Deerlodge National Forest provide potential/occupied lynx habitat. The lynx Conservation Strategy may modify or constrain salvage harvest and or prescribed fire to protect lynx denning habitat. As a result of these concerns specific fire suppression decisions or prescribed fire opportunities will be made on a case-by-case basis with management staff input via a Resource Advisor.

Resource objectives: These are a direct outcome of the Gravelly Landscape Analysis completed in September 1999. These vegetation objectives are recommendations for all the public ownership and are the direct outcome of Desired Future Condition of vegetation tempered by public input over a 3 year process. Both fire and mechanical treatments could be used to achieve the following objectives across all public ownerships over a ten year period: 1) Restore 4,400 acres of Aspen/year, 2) Restore Douglas fir savannah, multiple age lodgepole pine classes and promote whitebark pine in the subalpine fire habitat

type group, and 3) Maintain a mix of sagebrush age classes through time by treating 2,800 acres/year.

Fire objectives: Fire, subject to the constraints listed above, is desired to help manage the ecosystem. Fire/other methods may be used to restore dense timber stands to earlier seral stages and to open dense stands of conifers.

EAST MADISON (C8)

Area description: The area is primarily the foothills on the west slope of the Madison Mountain Range. It consists of a scattered grass/timber fuel type and is characterized by steep terrain and topography. The area includes approximately 391,100 acres (3 percent BLM, 2 percent state, 33 percent private, 62 percent FS). The majority of the BLM ownership is in the northwest portion of this area in the Beartrap Wilderness Area. The remaining BLM land is in the southwestern portion of the area and are scattered tracts intermingled with larger private land and Forest Service lands. The Bear Trap Canyon WA (6,000 acres) makes up 54 percent of the BLM acreage in this area.

Wildland fire history: From 1978 to 1999, federal agencies have responded to 70 fires which burned an estimated 8,000 acres. Average fire size was 114 acres.

Interface/intermix: Interface with private lands is high in the east portion of the Madison Valley. However, no interface areas with hazardous fuels buildup on public lands were identified as a priority.

Area concerns and constraints: The Lee Metcalf and the Bear Trap WSAs restricts the use of mechanical earthmoving equipment. Due to the configuration of BLM lands with other ownerships and the generally "flashy" fuels, use of prescribed "natural" fire is extremely difficult.

Fire objectives: Fire, subject to the constraints listed above, may be desired to help manage the ecosystem. Fire/other methods may be used to restore dense timber stands to earlier seral stages and to open dense stands of conifers.

SE FOOTHILLS/PIONEERS (C13)

Area description: The area is south of the Pioneer Mountain Range. About 70 percent consists of a scattered grass/timber fuel type and the remaining 30 percent is conifer type consisting mainly of Douglas fir, juniper, and limber pine. The area includes approximately 220,500 acres (46 percent BLM, 6 percent state, 32 percent private, 16 percent FS). The Farlin Creek WSA (1,139 acres) is adjacent to the 93,859 acre Forest Service East Pioneer

proposed wilderness. The Farlin Creek WSA accounts for only one percent of the BLM acreage in the area.

Wildland fire history: From 1978 to 1999, federal agencies have responded to 30 fires which burned an estimated 803 acres. Average fire size was 26.7 acres.

Intermix: The townsites of Argenta and Polaris as well as growing subdivisions are found within the area. Argenta is considered to have medium population density, low escaped fire potential, low potential for loss of life or property, and medium level of community support for hazardous fuel reduction actions. Birch Creek is also an nearby intermix area that is considered to have low population density, medium escaped fire potential, low potential for loss of life or property, and an unknown level of community support for hazardous fuel reduction actions.

Area concerns and constraints: A FS wilderness proposal in the northern part of the area may influence suppression efforts. Major elk and mule deer winter habitat surrounds much of this unit on public and private lands. Maintaining seasonal habitats and security cover is a concern. Portions of the Pioneer Mountains provide potential/occupied lynx habitat. The lynx Conservation Strategy may modify or constrain salvage harvest and or prescribed fire to protect lynx denning habitat. Sagebrush habitat on the south end of the unit supports sage grouse breeding and winter. Past sagebrush treatments and habitat fragmentation have reduced habitat availability and suitability. As a result of these concerns specific fire suppression decisions or prescribed fire opportunities will be made on a case by case basis with management staff input via a Resource Advisor.

Planning guidance: Specific vegetation goals and objectives were developed in the PLA (Pioneer Landscape Analysis).

Resource objectives: On Federal lands, the restoration of 25 percent (or 9,000 acres) of Douglas fir savannah, reduction of 1/3 or 2,000 acres of Douglas fir encroachment into sagebrush, restoration of aspen, Mountain Mahogany and riparian communities were all objectives outlined in the PLA.

Fire objectives: Fire, subject to the constraints listed above, may be desired to help manage the ecosystem. Use fire/other methods to limit the encroachment of Douglas fir into existing sagebrush stands, to restore and improve stands of aspens (especially in drainages), and to change dense Douglas fir stands back to savannah type communities.

Prescribed fires and other fuels management: Coordinate with the FS and private land owners (permittees) to use prescribed fires and mechanical treatments to meet PLA objectives.

MCCARTNEY/ROCHESTER (C11)

Also see Butte Field Office

Area description: The area is east of the Pioneer Mountain Range. About 70 percent consists of a scattered grass/timber fuel type and the remaining 30 percent is conifer type consisting of Douglas fir, juniper, and limber pine. The area includes approximately 274,000 acres (43 percent BLM, 5 percent state, 36 percent private, and 16 percent FS). The area is also characterized by numerous roads from past mining activities.

Wildland fire history: Between 1978 and 1999, federal agencies responded to 64 fires which burned an estimated 2,280 acres. Average fire size was 35.5 acres. Prescribed fires have been used on 2,000 acres in the McCarthy Mountain area since the 1980s.

Interface: This area contains isolated ranches, the community of Glen, and several fishing-related commercial operations.

Area concerns and constraints: The Humbug Spires WSA restricts the use of mechanical equipment. Fire management should be coordinated with the Forest Service. Protection of cultural resources (mining related) and private property requires careful consideration and consultation. The protection of mining-related cultural resources and private property are also concerns.

Resource objectives: Maintain/enhance lodgepole pine communities for a variety of size and age classes and stand structure. Protect the wilderness character of Humbug Spires WSA. Objectives would be similar to the Southeast Foothills where aspen, Douglas fir encroachment and Mountain Mahogany opportunities permit.

Fire objectives: Fire, subject to the constraints listed above, may be desired to help manage the ecosystem. Prescribed fire/other methods may be used to limit conifer encroachment into the McCarthy Mountain area.

Wildland fire suppression and rehabilitation:

Special areas and wilderness study areas: There are several areas within the McCartney/Rochester area that will receive special attention. The Humbug Spires WSA restricts the use of mechanical equipment. These areas have high resource values including cultural, relic,

vegetation, high visual and scenic values and/or historic attributes. A Resource Advisor shall assist the Incident Commander in making suppression decisions. Intensive fire suppression techniques, especially the use of heavy equipment, shall be carefully analyzed prior to being committed.

Forestry: Salvage harvest would not be allowed within the Humbug Spires WSA.

Prescribed fires and other fuels management: Prescribed fire and other fuels management strategies are appropriate to reduce hazardous fuels and meet other resource management objectives. Coordinate with the Forest Service to use prescribed fires and mechanical treatments to meet Pioneer Landscape Plan objectives.

BIG HOLE RIVER CORRIDOR (C3)

Also see Butte Field Office

Area description: About 50 percent consists of open sagebrush/grass parks. Another 45 percent is Douglas fir. Mountain mahogany is scattered throughout the area occurring on steep-rocky south and west facing slopes. Much of this is overtopped by Douglas fir. The remaining 5 percent of the area contains drainages dominated by lodgepole pine. The area is characterized by steep topography and close proximity to the highway. The area includes approximately 50,400 acres (14 percent BLM, 3 percent state, 16 percent private, 67 percent FS). The area is also characterized by numerous roads from past mining activities.

Wildland fire history: From 1978 to 1999, federal agencies have responded to 34 fires which burned an estimated 463 acres. Average fire size was 13.6 acres.

Interface/intermix: Both individual home site development and subdivision activity are increasing. No interface areas with hazardous fuels buildup on public lands were identified as a priority.

Area concerns and constraints: Steep topography and proximity to the highway and private land limits suppression options.

Resource objectives: Objectives would be similar to the Southeast Foothills where aspen, Douglas fir encroachment and Mountain Mahogany opportunities permit.

Fire objectives: Fire, subject to the constraints listed above, may be desired to help manage the ecosystem. Fire/other methods may be used to limit the encroachment of

Douglas fir into open sagebrush parks and areas of mountain mahogany.

NORTH RUBYS (D12)

Area description: Consists of dense stands of Douglas fir. Terrain is very steep. The area consists of approximately 26,800 acres in the Ruby Mountains WSA (100% BLM).

Wildland fire history: No fires have been reported in this area. However, forest mosaic stands indicate a history of multiple stand replacement fires.

Interface/intermix: There is little interface within the Ruby Mountains WSA. Private agricultural and forest lands surround the WSA along the southeast border. Agricultural land, much of which is irrigated during the growing season, surrounds the rest of the BLM lands

Area concerns and constraints: Fire control would be difficult due to poor access and steep terrain. Watershed damage and erosion could be concerns with large fires.

Resource objectives: The GLA recommended restoring 200 acres of aspen over 10 years, restoring 2,000 acres of sagebrush being lost to Douglas fir encroachment and restoring Douglas fir savannah stands by killing the competing understory of conifers.

Fire objective: Generally fire/other methods are desired to open dense conifer stands and to reduce heavy fuels.

Prescribed fires and other fuels management: Prescribed fires/other methods may be used to open dense conifer stands and reintroduce Douglas fir savannah structures.

Hazardous fuels reduction plans: Hazardous fuels reduction plans will be developed to reduce the risk of wildland fire near private lands especially along the BLM/private boundary in the southern and southeastern portion of the area.

Vegetation: Prescribed burning will be used to enhance the growth and vigor of certain species and to maintain specific vegetation communities. Maintain and promote park-like stands of mature conifers with mixed grass understory vegetation.

APPENDIX E

LEWISTOWN FIELD OFFICE FIRE MANAGEMENT PLAN

Background: The Lewistown Field Office manages 1.4 million acres of public lands (surface acres) in 16 counties located in central Montana. The Lewistown Field Office has field stations located in Great Falls and Havre, Montana. Sixty-four thousand acres within the area are designated as Wilderness Study Areas (WSAs), with the largest areas being the Cow Creek and Ervin Ridge WSAs. Thirty-six thousand acres are designated as Areas of Critical Environmental Concern (ACECs), with the largest areas being the Cow Creek, Sweetgrass Hills, and Judith Mountains ACEC. Important Recreation Management areas include Kipp Park, Coal Banks Landing, Judith Landing, and the Richard Wood Watchable Wildlife Area. Another special area is the Upper Missouri National Wild and Scenic River which flows through 149 miles of the Lewistown Field Office.

The Lewistown Fire Program has fire protection responsibility on both the Lewistown and Malta Field Office public lands, 3.5 million acres, and on approximately 200,000 acres of Forest Service lands. Since 1988, the Lewistown Fire Program has responded to an average of 42 fires a year burning an average 4,200 acres per year within the fire protection area. The Lewistown fire management program also provides assistance to other agencies within the Field Office area, including Charles M. Russell Refuge (FWS), the USDA Forest Service, the USDI Bureau of Indian Affairs, and the Department of Natural Resources-Montana. (See Map 6.)

Planning Guidance: The West Hi-Line Resource Management Plan (January, 1992), the Lewistown Field Office segment of the Judith Resource Management Plan (September, 1994), and the Great Falls Field Office segment of the Headwaters Resource Management Plan (July, 1984) will be updated as appropriate to incorporate the fire management plan objectives and guidance from this analysis.

Wildland fire suppression and rehabilitation guidance common to all areas within the Lewistown Field Office In addition to the state guidelines found in Appendix A, the following resources or values will be given further consideration as specified. Minimize the use of heavy equipment and avoid use of bulldozers in or near stream beds.

Cultural Resources: In areas sensitive for their cultural resource values conditional fire line tactics would emphasize the use of natural barriers and hand constructed fire lines.

Minerals Management: Mineral development and production facilities on public lands (federal surface) should be protected from all wildland fires.

Prescribed fire and other fuels management guidance common to all areas within the Lewistown Field Office boundaries In addition to the state guidelines found in Appendix A, the following resources or values will be given further consideration as specified.

Air Quality: No prescribed burning will be done if deterioration of Class I airshed values (especially Fort Peck Indian Reservation, and U.L. Bend National Wildlife Refuge) would result.

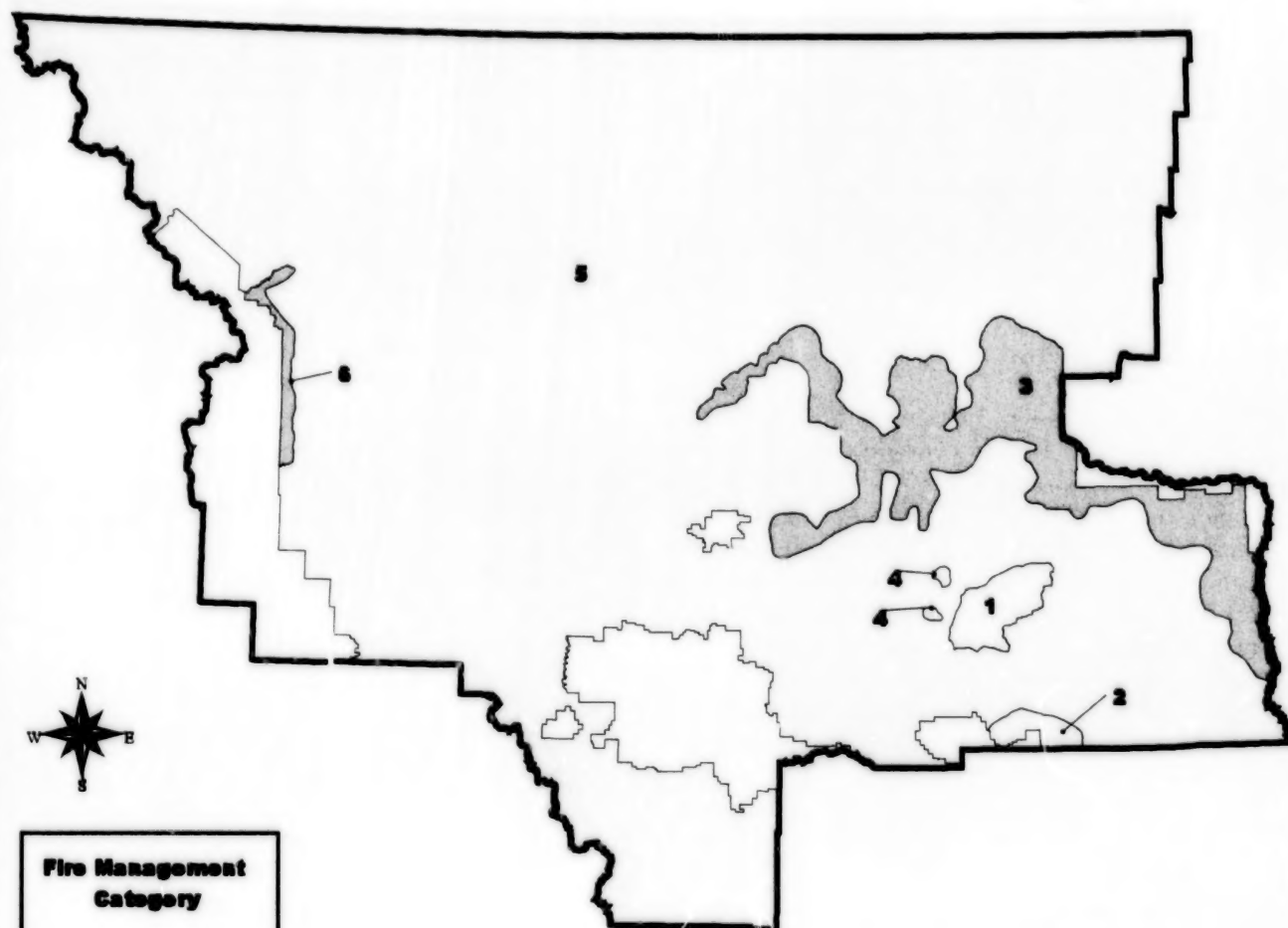
Ecosystem Management: Identify areas not meeting Standards of Health or where Land Use Plan objectives are not being met. Where appropriate, develop prescription burns which will meet Standards of Health, and Land Use plan objectives. Where fire fuel loading is an issue prescription burns or other fuel reduction strategies (grazing, mechanical harvesting/clearing, thinning, etc.) will be developed as needed to effectively reduce risks and restore Health.

Hazardous Fuels Reduction Plans: The hazardous fuel reduction plans will be developed using a risk, hazard assessment. Identified hazard reduction projects will be included as part of the watershed assessment planning process or stand alone plans will be developed for at risk communities

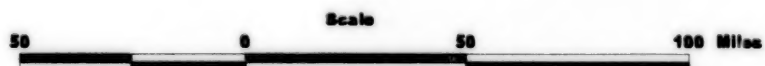
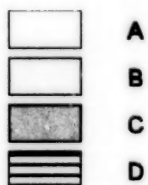
Minerals Management: Develop hazardous wildland fuels reduction plans to reduce the risk of wildland fire near mineral development, production, and storage facilities on or adjacent to public lands with hazardous fuels buildup. Care will be exercised to insure fire is excluded from coal bearing strata that is exposed to the surface. Fire treatment in areas that are developed for minerals oil/gas, will be coordinated with the developing companies.

Wildlife Habitat: Horizontal juniper and the non-sprouting sagebrush species have been identified as unique and valuable wildlife habitat for many different wildlife species though out the Lewistown Field Office area. These species only reproduce from available seeds. To accommodate the rejuvenation of these plants a mosaic of age classes in the community is desirable to make seeds available to burned areas and promote structural diversity. Every attempt will be made to avoid total treatment of these habitat types and to maintain a sufficient amount of older

MAP 6 LEWISTOWN FIELD OFFICE

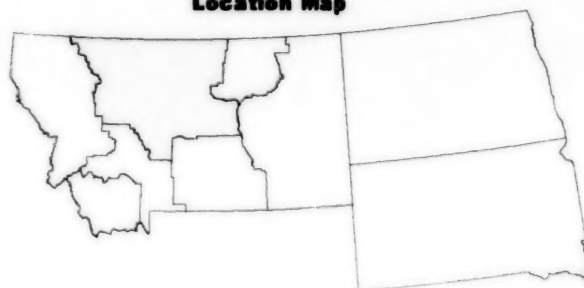


Fire Management Category



- 1 Judith
- 2 Little Snowy Mountains
- 3 Missouri Breaks
- 4 North and South Moccasins
- 5 Prairie Grass, Brush and Agricultural Lands
- 6 Rocky Mountain Front

Location Map



plants in the community. Prescribed burn projects in these habitat types will have a wildlife biologist available as a resource advisor and wildfire suppression personnel fighting fire in juniper and sagebrush communities will make every effort to keep the area biologist informed of the current situation.

PRAIRIE GRASS/BRUSH AND AGRICULTURAL LANDS (B5)

Area Description: The area in the west portion is predominately private land with small grain production. It contains only small tracts of isolated public land in the with the exception of a few blocks on the Marias or Teton Rivers. The topography is rolling plains with fair to good quality soils. Vegetation on private land consists primarily of grain and hay crops with some lands in the Conservation Reserve Program. Native range on private and public land is mixed grasses with minor components of sage and other brush species. Water sources include reservoirs, ponds, and a few small springs. The primary economic activity of the area is farming and cattle.

The Sweet Grass Hills ACEC contains 7640 acres of BLM administered land on the upper elevations of three buttes in Toole and Liberty Counties. This ACEC is important as a religious and cultural use area for Native Americans, as high value habitat for reintroduction of endangered peregrine falcons and as seasonally important elk and deer habitat.

A block of approximately 18,000 acres of public land at Lonesome Lake is Bureau of Reclamation land which BLM has the responsibility to oversee. The area is a relatively flat area in Northern Chouteau county with gently sloping coulees and a large ephemeral lake. The area has been nominated for an ACEC because it is partly an island of native grasslands in a vast area of farmland. 2120 acres of the public land is leased for farming and generally in small grain production. Soils are mostly silty types and reasonably productive. Most of the vegetation in the area is annual grain crops. Perennial vegetation is Conservation Reserve Program, minor amounts of hay production, crested wheatgrass and prairies dominated by short grass species. Some swales and pseudo riparian and wetlands are mid grass and herbaceous wetland communities. The area provides habitat for waterfowl, upland, and song birds, deer, and pronghorns. Water sources in the area are small reservoirs, pits, wells and pipelines. The primary economic activity in the area is dryland small grain production and cattle production. All the public lands are either leased for farming or permitted for livestock grazing in between the May to November period.

The North Central part of this area includes three blocks of public land surrounded by private farm land. Fresno is an area of dissected coulees along the reservoir on Milk River. Chain of Lakes Coulee is a wetland area accessory to the Fresno area. Wildhorse Lake is a high basin of sandy soils near the Canadian border which is a dry lake bed for most of the year. Native vegetation in these areas is mixed prairie grasslands. Coulees and draws have minor woody communities. Improvements at Chain of Lakes Coulee have resulted in mature marshes and riparian areas dominated by herbaceous species. Area wildlife species include deer, upland birds and waterfowl. The primary economic activity in the area is dryland grain farming with some minor livestock operations. Fresno has developed summer recreation facilities including; picnic and camp sites, and summer cabins.

North Blaine county is the northeast extent of this polygon. This portion of the polygon has a fair amount of public land dispersed through the area as a result of Bankhead Jones Act lands reconveyed in the 1930s. The area is glaciated plains with native vegetation being mostly mixed and short grass species. The better soils in this area are mostly private land and are predominately in dryland grain production, however along Milk River and in a few outlying areas irrigation systems have been installed and a variety of annual and perennial crops are grown. Conservation Reserve Program enrollment of private land is common in this area. Much of the native plains that was plowed and now reseeded to perennial plants is in crest wheatgrass or other species. Coulees will have a good diversity of sage and other brush species. Wildlife in the area is pronghorn, deer, waterfowl, and upland birds. Sage grouse, Swift fox, mountain plover, prairie dogs, assorted raptors are established in the area. Primary economic activities are farming/ranching, natural gas and some oil field development.

Comprising 4,600 acres of BLM administered land in Toole County, the Kevin Rim ACEC has a high potential as a peregrine falcon reintroduction area and is currently habitat for a variety of raptors. It is also important for its high density of cultural resources.

The upland area of Lonetree and Ragland Benches is in South Blaine county. There are minor amounts of public land on the top of the bench but the area is bordered on three sides by regions of continuous public land. The soils are silty and clay texture soil on rolling upland plateau with in the Missouri Breaks. The vegetation on the private lands in this area is regularly annual grain crops with some hay and Conservation Reserve Program acres. The native range on private and public land in this area is sage brush grass lands verging into some Missouri Breaks juniper and conifer on break slopes. The major wildlife species in this area are

Mule deer, Bighorn Sheep, transitory elk, sage grouse and sharptail grouse. Water resources in this area are constructed reservoirs, ponds and a few small springs. The primary economic activity in this area is farming and cattle grazing. The plant community will be mostly private land grain fields in this area. The primary economic activity in the area is dryland small grain production and cattle production. All public lands are either leased for farming or permitted for livestock grazing. Permitted grazing on public lands occurs between May and November.

The majority of the area in the South East part of the polygon is private land with crops or small tracts of commercial timber consisting of ponderosa pine. Most of the BLM land was farmed in the past (LU land) and is currently mostly crested wheatgrass, mixed native grasses, and some scattered sagebrush. The riparian vegetation along drainages provide year-long habitat for antelope and deer. Numerous power lines, highways, and small towns are found in the area. The North Central area includes three blocks of public land in North Hill County that are surrounded by private land with livestock production. Fresno is a developed summer recreation reservoir.

Another area for special consideration would be the Acid Shale Pine Forest ACEC located in eastern Fergus and western Petroleum Counties. This area is important because of its small stands of timber and its diverse wildlife populations.

Wildland Fire History: From 1980 to 1999 Federal agencies have responded to 40 fires on BLM Grass and Range lands which burned an estimated 2,605 acres. Average fire size was 65 acres.

Interface/intermix: Communities and isolated ranches are located throughout the Grass and Range Lands adjacent to public lands. Typically these areas are surrounded by scattered grass and sage brush vegetation or crop lands. Communities include Big Sandy, Flatwillow, Havre, Roy, Winifred, Winnett, Chinook, Harlem, Turner, Hogeland, Kevin, Sunburst and Loma.

Area Concerns and Constraints: Special concerns and constraints include scattered land pattern of public, state, and private land; ACEC with cultural, paleontological, and vegetative values that might be affected by fire fighting equipment; and the use of earth moving/tillage equipment in the Wilderness Study Areas and ACEC. Wildlife habitat for waterfowl, upland birds, songbirds, deer, and, antelope.

Resource Objectives: Manage native vegetation to meet standards for rangeland health and to create islands of habitat for birds and wildlife. Maintain stable soils and sustain current land uses. Sagebrush habitats, especially

those in identified sage grouse nesting and wintering areas and big game concentration areas should be maintained. Scattered stands of Ponderosa Pine, especially those exhibiting old growth characteristics, shall be maintained.

Fire Management Objectives: Wildland fire is generally not desired due to large amount of private and state land and agricultural production throughout the area. Fire, in some cases can be desirable throughout this zone. Obvious concerns focus around structural developments, crop lands, livestock and livestock forage needs. Management of unplanned fire occurrence would be based on values at risk, current and predicted weather and current land management direction. Prescribed fire could be used based on management direction and agreements with adjacent landowners.

Wildland Fire Suppression and Rehabilitation:

Cultural Resources: Sensitive areas for cultural resources include the Sweet Grass Hills ACEC, Kevin Rim ACEC and Lonesome Lake. The Kevin Rim ACEC and Lonesome Lake areas contain high densities of prehistoric sites. The Sweet Grass Hills ACEC is a traditional cultural property important to the Blackfeet and Chippewa-Cree tribes. To protect cultural resources in sensitive areas during wildland fire suppression, BLM will follow the guidance in Appendix A and in Wildland Fire Suppression and Rehabilitation Guidance Common to All Areas Within the Lewistown Field Office Boundaries. The BLM will also follow this guidance to protect archaeological resources from further damage during rehabilitation operations in sensitive areas and all other areas of the polygon.

Prescribed Fire and Other Fuels Management: Use prescribed fire to enhance desired plant communities, to manage wildfire, and to reduce hazardous fuel loads. Prescribed fire would generally not be used in some areas due to limited BLM ownership unless coordinated with adjacent landowners to achieve mutually beneficial objectives. Where feasible, prescribed fire may be used to enhance desired plant communities and to provide improved wildlife habitat. Land use will be monitored and adjusted as necessary after fire to sustain stable soils and vegetation. When completing specific fire plans and designs in the Sweet Grass Hills ACEC, Lonesome Lake area and Mount Baldy area, consult appropriate Native American tribes regarding the potential to affect traditional cultural or religious concerns.

Grazing Management: Incorporate grazing strategies to reduce hazardous fire fuels near human habitation. Prescription burns may be implemented to meet Health of the land standards and land use plan objectives.

Vegetation: Prescribed fire may be used to enhance the growth and vigor of certain species and to maintain specific vegetation communities. To maintain viable sagebrush communities for winter range of deer, antelope, and sage grouse, a mosaic of mature old growth sagebrush will be maintained.

Wildlife: Inventory for raptor nests and grouse nesting areas will be conducted on each proposed prescribed burn area one spring prior to the proposed project date. If nests are present, appropriate action including buffer areas will be identified in the burn plan to protect the site. In those areas where sagebrush is treated, the treatment will be done no more frequently than once in 30 years, unless necessary to reduce undesirable species encroachment. The use of prescribed fire in identified sage grouse habitat will be coordinated with private landowners and MT Fish, Wildlife and Parks.

JUDITH (B1), NORTH AND SOUTH MOCCASINS (B4), and LITTLE SNOWY MOUNTAINS (B2)

Area Description: The Little Snowy Mountains consist of blocks of public land surrounded by private and/or Forest Service lands. These areas are mountainous with steep slopes and heavy timber. Commercial timber is abundant with Douglas fir on the north slopes, ponderosa pine on the south slopes, and lodgepole pine at the highest elevations. Riparian vegetation occurs along the numerous small streams and drainage. There are interspersed grassy meadows within the timber types. Much of the private land has summer cabins and home sites. Secondary roads intersect the area. The area offers big game summer and winter ranges and habitat for upland game species. The Judith Mountain Scenic Area ACEC is located the Judith Mountain area. The Collar Gulch ACEC in the Judith Mountains contains aquatic habitat for the West slope cutthroat trout (listed as a sensitive species). The endangered peregrine falcon is present in the Moccasin Mountains. Recreational uses include hunting, fishing, wildlife viewing, hiking and caving. The area is a VRM class II area with numerous interspersed historical and current mining claim sites and structures. The area on the north and east slope of the Little Belt Mountains and has relatively small tracts of public land surrounded by or adjacent to private, Forest Service, or state lands. Private cabins and home sites are scattered throughout the area. There are areas of steep slopes with heavy timber, generally consisting of Douglas fir on the north slopes, ponderosa pine on the south slopes, and lodgepole pine at the highest elevations. There are interspersed grassy meadows within the timber types.

The area is also characterized by numerous roads from past mining activities.

Wildland Fire History: From 1980 to 1999 Federal agencies have responded to 108 fires on federal lands which burned an estimated 15,200 acres. Average fire size was 141 acres.

Interface/intermix: This area contains many small communities and ranches which are built adjacent to public lands containing timber and steep slopes. The potential exists for fire related incidents. In the Judith Mountains, communities include Maiden and Giltedge and scattered homes in Limekiln Canyon and Ruby Gulch. In the Moccasin Mountains, the community of Kendal and surrounding ranches are intermix sites. In the Little Snowy Mountains, the communities of Forest Grove and Grassrange along with scattered ranches located along Flatwillow Creek and Red Hill road are intermix sites.

Area Concerns and Constraints: Scattered land pattern, proximity to private land. Special concerns and constraints include scattered land pattern and proximity to private land; ACECs with cultural, paleontological, and vegetative values that might be accessed by fire fighting equipment; and the use of earth moving/tillage equipment in the Wilderness Study Area on the Lewis and Clark National Forest. Sensitive areas for cultural resources include the Dry Range west of the Smith River in Meagher County.

Resource Objectives: Manage native vegetation to meet standards for rangeland health. Maintain stable soils and sustain current land uses. Sagebrush habitats, especially those in identified sage grouse nesting and wintering areas and big game concentration areas should be maintained to the maximum extent possible. Scattered stands of Ponderosa Pine, especially those exhibiting old growth characteristics, shall be maintained where possible.

Fire Management Objectives: Fire, in most cases, can be desirable throughout this zone. However, each occurrence will have special consideration. Obvious concerns focus around structural developments, crop land, livestock and livestock forage needs. Social and political considerations will dictate how each fire occurrence will be managed.

Wildland Fire Suppression and Rehabilitation: Minimize the use of heavy equipment and avoid use of bulldozers in or near stream beds.

Prescribed Fire and Other Fuels Management: Prescribed fires would generally be used in this area to reduce the build up of natural and activity fuels, reduce the threat of stand replacement fire and reduce fire hazard in interface, rural intermix and residential areas. All

prescribed fire activity would be coordinated with adjacent landowners to achieve mutually beneficial objectives. In some areas prescribed fire would be beneficial to achieve desired plant communities and to enhance wildlife use. Land uses will be monitored and adjusted as necessary after fire to sustain stable soils and vegetation. Mechanical treatment of hazardous fuels would be used in some areas as a first entry. This would include the use of wood products and hand piling and burning to reduce the threat of escaped prescribed fire. The second entry with prescribed fire would be broadcast/under burn. When completing specific fire plans and designs in specific areas sensitive for Native American traditional cultural and religious concerns, consult with appropriate Native American tribes on the potential to affect traditional cultural or religious concerns.

Forestry: The areas of primarily forested ground make up the vast majority of the Commercial Timber Base within the Lewistown and Malta Field Offices. The majority of the timber is Ponderosa pine, Douglas fir and lodgepole pine as well as scattered pockets of hardwood species. Most areas show signs of decadence and mortality due to overstocking and the absence of fire and/or Forest Management. New stands of Ponderosa pine and Douglas fir are encroaching into areas which historically were natural openings and meadows. Resulting fuel loads far exceed the normal range of variability. Because of limited public access to most of these forested tracts management is limited to opportunities that present itself through adjacent landowner activities. As forest management opportunities present themselves silvicultural practices will be applied which emphasize overall health of the forested stand and reducing fuel loadings in order to prevent loss due to fire, insects and disease.

Vegetation: Prescribed burning may be used to enhance the growth and vigor of certain species and to maintain specific vegetation communities that are fire adapted. Maintain and promote stands of mature conifers with mixed grass and shrub under story vegetation. Protect riparian areas that exhibit an over story of deciduous trees from extreme fire events as conditions allow. To maintain viable sagebrush communities for winter range of deer, antelope, and sage grouse, a mosaic of mature old growth sagebrush will be maintained.

Wildlife: Prescribed fires should not be authorized within mile of a raptor nest from March 1 to August 1 each year or on crucial winter range between December 1 and March 31. Inventory for bird nests and traditional mammal birthing areas will be conducted on each proposed prescribed burn areas in forested habitat one spring prior to the proposed project date. If permanent nest or birthing

areas are located appropriate action including buffer areas will identified in the burn plan to protect the site.

MISSOURI BREAKS (C3)

Area Description: The Missouri Breaks polygon includes those parts of Petroleum County lying north of Highway 200 and north and east of the Valentine-Dovetail Road to the Missouri and Musselshell Rivers. The polygon contains those lands in north Fergus County adjacent to the Missouri River including the Armells Creek and Judith River drainages. South-eastern Chouteau County along the Missouri River and Arrow Creek drainage, and southern Blaine County along the Missouri River, the Lone Tree Bench area, and the Bullwacker drainage make up the remaining portion of the Lewistown Missouri Breaks polygon. This area is a mix of public and private land. Square Butte (mostly public) and surrounding private land in Eastern and Southern Chouteau County is also included in this polygon. The land form is a series of drainages and ridges running mostly north to south. The area is made up of rolling upland plateaus with moderate to deeply incised canyons. Some of the private uplands are in annual cereal crop production and some are in the Conservation Reserve Program. Native vegetation is primarily sage brush and sage brush grasslands verging into Ponderosa Pine, Douglas Fir, and juniper communities. Riparian vegetation including native shrubs and Cottonwood trees exists along the Missouri river and drainages throughout this polygon. Water sources within the area include small reservoirs, water-savers, wells, pipelines, and natural streams and rivers. Predominate wildlife species include mule deer, sage grouse, sharptail grouse, elk, and Bighorn sheep. Economic activity consists of small grain production, natural gas development, livestock grazing, and recreations activities including floating, tourism, and hunting. Access in this area depends on the weather as roads become difficult to drive with precipitation. Cow Creek ACEC is located in southern Blaine and Phillips County. This area is important because of its historical values with the Nez Perce and Lewis and Clark Trails and its diverse wildlife populations. Many Wilderness Study areas (WSAs) exist throughout the area including Woodhawk and Dog Creek WSAs in northern Fergus County, and Stafford, Ervin Ridge, and Cow Creek WSAs in southern Blaine County. These areas are significant because of the historical value, vegetative fuels, high recreation use, and diverse wildlife populations along the Missouri River Corridor where these WSAs exist.

Wildland Fire History: From 1980 to 1999, Federal agencies responded to 296 fires on federal lands which burned an estimated 24,000 acres. Average fire size was 81 acres.

Interface/Intermix: Ranches and recreation areas are scattered along the Missouri River. Private ranches adjacent to public lands are located throughout the Breaks polygon. Vegetation consists of grass and sagebrush lands with scattered pockets of timber and crop lands near most ranches. Recreation sites along the Missouri River include the Richard Wood Watchable Wildlife area, Coal Banks Landing, Judith Landing, Stafford Ferry, and James Kipp Park.

Area Concerns and Constraints: Concerns include the presence of elk and mule deer; the mix of public and private land with crop production; difficult access; ACECs with cultural, paleontological, and vegetative values that might be accessed by fire fighting equipment; and the use of earth moving/tillage equipment in the Wilderness Study Areas. Sensitive areas for cultural resources include the Cow Creek ACEC, Nez Perce National Historic Trail.

Resource Objectives: Manage public lands for sagebrush grassland and Missouri Breaks interface to provide season long forage for wildlife. Limit or minimize erosion. Manage native vegetation to meet standards for rangeland health. Maintain stable soils and sustain current land uses. Sagebrush habitats, especially those in identified sage grouse nesting and wintering areas and big game concentration areas should be maintained to the maximum extent possible. Scattered stands of Ponderosa Pine, especially those exhibiting old growth characteristics, shall be maintained where possible.

Fire Management Objectives: Fire could be a positive influence in much of this area and restoration of natural fire regimes will be encouraged where practical. However, each fire occurrence will receive special consideration. A specific fire management plan will be included in the Missouri Breaks National Monument for that portion of this polygon. Obvious concerns focus around structural developments, crop lands, livestock and livestock forage needs. Social and political considerations dictates how each fire occurrence will be managed. Limited fire suppression based on current fire danger, resource availability and predicted weather may be used to ensure safety of fire suppression personnel, reduce cost of fire suppression, and provide an opportunity to return fire to its natural role in the ecology of the area. Only natural fire occurrences (lightning) will be used for limited suppression.

Wildland Fire Suppression and Rehabilitation: Because of risk to high value cash crops, wildfire will be suppressed prior to harvest during any hot or dry season. Appropriate management responses to wildland fire in ACEC/WSA areas would include, conditional fire line tactics including the use of natural barriers and hand

constructed fire line. Use of earth moving/tillage equipment would be prohibited for wildland fire suppression in ACEC/WSA areas unless waived by the Field Office Manager or an authorized officer. Staging areas and fire camps would be placed outside these areas wherever possible. The application of fire retardant would be restricted within an ACEC which contains rock art. A Resource advisor will be on site during wildland fire suppression and rehabilitation efforts to insure compliance with the decisions and guidelines for each ACEC/WSA area. Give careful consideration to use of heavy equipment to minimize erosion.

Prescribed fire and other fuels management: Prescription burns may be used to protect infrastructure or wildlife habitat that would be permanently lost in the event of a catastrophic wild fire. Prescribed fire may be used to achieve desired plant communities and to reduce hazardous fuel loads. Prescribed fires would generally not be used in areas of limited BLM ownership unless coordinated with adjacent landowners to achieve mutually beneficial objectives. Minimize impacts to sagebrush from prescribed fire wherever possible. Land uses will be monitored and adjusted as necessary after fire to sustain stable soils and vegetation. Some prescribed fire management objectives may be carried out by the limited fire suppression plan developed as part of the Upper Missouri watershed plan or National Monument Plan. When completing specific fire plans and designs in the Cow Creek ACEC, consult with appropriate Native American tribes on the potential to affect traditional cultural or religious concerns.

Forestry: Timber in the breaks is found on clay shale uplands of the sedimentary plains. Ponderosa pine is the dominant commercial tree species although lesser amounts of Douglas fir and Spruce do exist. The Breaks are not considered in the traditional timber base. However, harvest opportunities will be considered on a case by case basis when silvicultural objectives can be met that emphasize forest health, stand density reduction and reducing unnatural fuel loadings.

Vegetation: Prescribed burning will be used to enhance the growth and vigor of certain species and to maintain specific vegetation communities. Maintain and promote stands of mature conifers with mixed grass and shrub under story vegetation. Protect riparian areas that exhibit an over story of deciduous trees from extreme fire events as conditions allow. To maintain viable sagebrush communities for winter range of deer, antelope, and sage grouse, a mosaic of mature old growth sagebrush will be maintained.

Wildlife: Inventory for raptor nests and traditional elk calving areas will be conducted on each proposed

prescribed burn areas one spring prior to the proposed project date. If nests or calving areas are located, appropriate action including buffer areas will be identified in the burn plan to protect the site. In those areas where sagebrush is treated, the treatment will be done no more frequently than once in 30 years, unless necessary to reduce undesirable species encroachment. The use of prescribed fire in identified sage grouse habitat will be coordinated with private landowners and MT Fish, Wildlife and Parks.

ROCKY MOUNTAIN FRONT (C6)

Area Description: The Rocky Mountain Front Polygon comprises 4 separate tracts of Forested and Non-Forested Parcels which make up the Outstanding Natural Area, (ONA): Blindhorse, Ear Mountain, Chute Mountain, and Deep Creek/Battle Creek. These areas lie North of Gibson Reservoir and West of Choteau, MT. Direction for Forest Management opportunities is clearly specified in the Activity Plan for the Rocky Mountain Front, 7/88. The Front Range contains four Outstanding Natural Areas (ONAs) between Muddy Creek and the North Fork of the Teton River; Blind Horse (4,927 acres), Ear Mountain 1,869 acres, Chute Mountain (3,205 acres) and Deep Creek/Battle Creek (3,086 acres). These areas were designated to be managed for their outstanding scenic and wildland values.

Outstanding Natural Areas: Use the most effective wildland fire suppression methods possible while sustaining the least damage to ONA values in compliance with the Rocky Mountain Front Outstanding Natural Area Activity Plan/ Environmental Assessment. Suppression methods may include pumper trucks and hand-line construction. Use of earth moving equipment and fire retardant will be prohibited unless it is needed to prevent fire from spreading to adjacent private lands and is specifically authorized by the Field Manager. Place staging areas and fire camps outside of ONA boundaries unless otherwise authorized by the Field Manager. Ensure a resource advisor is on site during wildland fire suppression and rehabilitation to ensure compliance with decisions and guidelines.

Interface/intermix: Arrowleaf at Ear Mountain, Rogers Pass area.

Area Concerns and Constraints: Big game species include elk, mule deer, and mountain goats, numerous bird species include raptors. Steep slopes and heavy dog hair timber pose safety hazards for fire fighters. Special concerns and constraints include ACECs with cultural, paleontological, and vegetative values that might be accessed by fire fighting equipment, and the use of earth

moving/tillage equipment in the Outstanding Natural Areas (ONA) and WSA. The Front range polygon is a sensitive area for cultural resources. There are high densities of cultural resources at lower elevations. Traditional cultural properties may be expected at middle and higher elevations.

Resource Objectives: Manage native vegetation to meet standards for rangeland health. Maintain stable soils and sustain current land uses. Sagebrush habitats, especially those in identified sage grouse nesting and wintering areas and big game concentration areas should be maintained. Scattered stands of Ponderosa Pine, especially those exhibiting old growth characteristics,¹ shall be also maintained.

Fire Management Objectives: Fire, in most cases, can be desirable throughout this zone. However, each occurrence will have special consideration. Obvious concerns focus around structural developments, crop lands, livestock and livestock forage needs. Social and political considerations will determine how each fire occurrence will be managed. Initial attack fire suppression in this polygon is the responsibility of the Lewis and Clark National Forest under the Six Party Fire Protection Agreement.

Prescribed Fire and Other Fuels Management: When completing specific fire plans and designs in the Front Range Polygon, consult with appropriate Native American tribes on the potential to affect traditional cultural or religious concerns.

Outstanding Natural Areas: When completing specific fire plans and designs in ONAs, target areas where prescribed fire can benefit range condition and wildlife habitat. Target areas may include rough fescue and/or Idaho fescue grassland benches where a majority of fescue plants have become "wolfy" and decadent aspen groves in need of regeneration for wildlife. Highest priority for burning should be given to those benches important as bighorn sheep and elk winter range. Use prescribed fire methods which will not damage ONA values. Place staging areas and fire camps outside the ONA boundaries unless otherwise authorized by the Field Manager. Use of heavy equipment will be avoided and use of power tools and motorized equipment will be limited.

Timber Management: Although the emphasis in these areas is not timber production, forest management including harvesting timber should be a considered alternative for meeting land management objectives. Silviculture treatments will emphasis stand density reduction and early successional stages indicative for the given habitat type. Forest treatments for the purpose of fuel reduction, forest health and salvage will be given priority.

The current plan states "No timber harvest, post and pole cutting, timber improvement practices, firewood cutting, or Christmas tree cutting will be permitted on the ONAs." Because of current language in the land use plan management of the timbered resources for the purpose of forest health and fuel reduction is not practical, this would be a plan amendment.

BIG SNOWY MOUNTAINS

The Central Montana Fire Zone provides protection for this area under the Six Party Fire Cooperative Fire Protection Agreement. The Central Zone is responsible for initial attack suppression and fire related rehabilitation on approximately 200,000 acres of the Lewis and Clark National Forest located in the Big Snowy Mountains.

Special Protection Requirements: Special protection plan and fire management plan is being developed at this time by the Lewis and Clark National Forest and will be added to this plan when completed.

APPENDIX F

MALTA FIELD OFFICE FIRE MANAGEMENT PLAN

Background: The Malta Field Office manages 2.1 million acres of public lands (surface acres) in Phillips and Valley counties excluding the Fort Belknap and Fort Peck Indian Reservations. This is about 36 percent of the land within the two counties. Most of the land is rolling prairie terrain except for the southern portion which is the Missouri Breaks terrain type consisting of ridges and coulees. The rolling prairie terrain is vegetated with grasses, sagebrush, willows, and cottonwoods along some of the drainages. The Missouri Breaks terrain is vegetated with grasses, sagebrush on the ridges, and ponderosa pine on the slopes. Some willow and cottonwoods are found along some of the drainages.

The Malta Field Office contains four ACECs (Cow Creek, Prairie Dog Towns, Big Bend of the Milk River, and Azure Cave) and three WSAs (Burnt Lodge, Bitter Creek, and Antelope Creek). (See Map 7.)

Planning Guidance: Current guidance is provided by the Valley Resource Area Resource Management Plan (August, 1994) and the Phillips Resource Area Resource Management Plan (August, 1994). The fire management direction in the Valley Resource Area Resource Management Plan (pages 29-30) and the Phillips Resource Area Resource Management Plan (pages 34-35) will be updated as necessary to include the fire management objectives and guidance for each fire management zone described below.

Wildland fire suppression and rehabilitation guidance common to all areas within the Malta Field Office boundaries. See the state guidelines found in Appendix A.

Prescribed fire and other fuels management guidance common to all areas within the Malta Field Office boundaries In addition to the state guidelines found in Appendix A, the following resources or values will be given further consideration as specified.

Wildlife: In those areas where sagebrush is treated, and the objectives are met, the treatment should be done no more frequently than once in 30 years. In sagebrush/grasslands outside of those identified to meet the mature/old growth strategy, prescribed burning may be used.

GRASS AND RANGE LANDS (B1)

Area Description: The Milk River corridor is a lowland corridor of the Milk River that begins in Hill and Blaine

counties and extends through Phillips and Valley Counties. Only small tracts of public land are in this area. The river bottom generally has good quality soils. Crop production in the area includes hay, small grains, potatoes, corn, and other dry land crops as well as irrigated crop production. Mature cottonwood forests are common along the river corridor. Wildlife species in the area includes whitetail deer, pheasants, waterfowl, raptors and songbirds. This area also has noxious weed infestations and is an origin dispersal source for many weed species. The area has a high density of urban interface.

The Phillips and Valley County upland plains are glaciated areas north and south of the Milk River corridor. A large amount of public land is scattered in small tracts or modest sized blocks. This area is commonly referred to as Prairie Potholes and is rolling uplands of silty soils. Numerous streams, pits, and reservoirs are in the area. Private land is farmed for irrigated hay, grain crops, and CRP. Numerous crested wheatgrass seedlings occur on both private and public land. Native vegetation is mid and short grass prairies on the uplands and woody draws and pseudo riparian communities in draws, lowlands and coulees.

Fire History: From 1980 to 1999 Federal agencies have responded to 40 fires on BLM Grass and Range lands which burned an estimated 31038 acres. Average fire size was 776 acres.

Interface/intermix: Communities and isolated ranches are located throughout the Grass and Range lands adjacent to public lands. Typically these interface areas are surrounded by scattered grass and sage brush vegetation or crop lands. Communities within this polygon include the communities of Dodson, Loring, Whitewater, Saco, St. Maries, Hinsdale, Malta, and Glasgow. Nelson Reservoir, a popular recreation site, is another potential site.

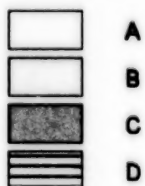
Area Concerns and Constraints: High value private and state land is adjacent to public lands. Forage production, weed control, riparian areas, wildlife habitat on public lands as well as crop and forage production on adjacent private lands will all require fire management consideration.

Resource Objectives: Public lands would be managed for high quality grasslands with nesting cover for waterfowl and upland birds, escape cover and space for other wildlife. Resource objectives include: 1. maintaining native species where they currently exist while managing non-native weeds, and 2. managing for diversified grasslands which

MAP 7 MALTA FIELD OFFICE



Fire Management Category



- 1 Grass and Range Lands**
- 2 Little Rocky Mountains Timber**
- 3 Missouri Breaks**

Location Map



provide livestock and wildlife forage, and nesting and rearing habitat. The uplands, riparian and wetlands areas should be managed for proper functioning condition. The area should be managed for diversified grasslands to provide livestock and antelope forage, nesting and rearing habitat for birds.

Fire Management Objectives: Wildland fire is not desired due to the large amount of private and state land and agricultural production throughout the area. The appropriate management response to wildland fire within the Milk River Corridor and the Phillips and Valley County Upland Plains would be aggressive fire suppression. Prescribed fire and other fuels management strategies may be used to reduce hazardous fuels and achieve other resource management objectives.

Wildland Fire Suppression and Rehabilitation Guidance:

Cultural: Appropriate management response to wildland fire in ACEC areas would include conditional fire line tactics (e.g., the use of natural barriers and hand constructed fire line). Use of earth moving/tillage equipment and the application of fire retardant would be restricted for wildland fire suppression in proposed ACEC areas unless waived by the Field Office Manager or an authorized officer.

Prescribed Fire and Other Fuels Management Guidance: Prescribed fire would generally not be used in the Milk River Corridor; however, BLM could use prescribed fires to reduce hazardous fuels, to manage undesirable plants (noxious weeds), to achieve grazing management objectives, or to achieve desired plant communities. The BLM could also be a cooperator on a prescribed fire project initiated by another party. All fuels management projects should be monitored (short and long term) to determine if project objectives have been met and for future reference. Land uses should be monitored and adjusted as necessary after fire to sustain stable soils and determine the extent objectives have been met. Prescribed fires may be used to rejuvenate meadows, wetlands, and grasslands to favor waterfowl, increase herbage production, manipulate vegetative community structure or to reduce hazardous fuels. All fuels management projects should be monitored (short and long term) to determine if project objectives have been met and for future reference.

Vegetation: Prescribed burning may be used to enhance the growth and vigor of certain species and to maintain specific vegetation communities. However, to maintain viable sagebrush communities for winter range of deer, antelope, and sage grouse, a mosaic of mature old growth sagebrush will be maintained.

MISSOURI BREAKS UPLANDS (C3)

Area Description: The Malta Field Office portion of the Missouri River Breaks Uplands includes large amounts of public land in south Phillips and Valley counties. Within this area are portions of the Cow Creek Wilderness Study Area (WSA), the Burnt Lodge WSA, and the Antelope Creek WSA and the Upper Missouri Breaks National Monument. Soils in this area are mostly heavy clays with some Bearpaw shales. Topography consists of rolling ridge tops with moderate to deeply incised canyons between. Native vegetation is a mosaic of sagebrush grasslands, juniper communities with conifers. Some draws have minor discontinuous riparian communities. Vegetation on private land in the area includes rangeland, annual small grains, hay, or CRP. Wildlife species in this area include mule deer, whitetail deer, antelope, bighorn sheep, mountain lion, elk, sage grouse, sharptail grouse, and waterfowl. Primary economic activity in the area is cattle production. There are few permanent residences or other developed habitations. Primary economic activity in the area is cattle production. There are some producing gas wells and a delivery pipeline system in the region.

Wildland Fire History: From 1980 to 1999 Federal agencies have responded to 131 fires on federal lands within the Breaks polygon which burned an estimated 11442 acres. Average fire size was 87 acres.

Interface: This area contains several communities and ranches which were built adjacent to public lands containing timber, grass, and steep slopes. The potential exists for urban interface fire related incidents. Interface areas adjacent to the Little Rocky Mountains include the communities of Zortman and Landusky. In the breaks are numerous ranches and the popular Pine Hills Recreation area which contains a cluster of homes surrounded by public lands.

Area Concerns and Constraints: Special concerns and constraints include historic cabins, wildlife species, soil erosion, an ACEC with cultural, paleontological, and vegetative values that might be effected by fire fighting equipment, and the use of earth moving/tillage equipment in the Burnt Lodge, Antelope Creek, and Cow Creek Wilderness Study Areas.

Resource Objectives: Public lands will be managed to provide a mosaic of forage and cover types to accommodate multiple use objectives. Management strategies should not aggravate the naturally high erosion rates. The natural vegetation and land form characteristics would be maintained to protect the WSA and ACEC characteristics. Resource objectives include: 1. maintaining native species where they currently exist while

managing non-native weeds; 2. managing for diversified grasslands which provide livestock and wildlife forage, and nesting and rearing habitat; 3. maintaining appropriate level of sagebrush cover, diversity, and dispersion in compliance with current guidance; 4. protecting, maintaining, and enhancing crucial wildlife habitats, wetland and riparian habitats; 5. maintaining an appropriate level of domestic livestock forage in any allotment to minimize disturbance to current grazing systems; and 6. maintaining an appropriate amount of thermal cover for critical wildlife.

Fire Management Objective: Fire could be a positive influence in much of this area and restoration of natural fire regimes will be encouraged where practical. However, each occurrence will have special consideration. Obvious concerns focus around structural developments, crop lands, livestock and livestock forage needs. Social and political considerations will dictate how each fire occurrence will be managed. Limited fire suppression based on current fire danger, resource availability and predicted weather may be used to ensure safety of fire suppression personnel, reduce cost of fire suppression, and provide an opportunity to return fire to its natural place in the ecology of the area. Only natural fire occurrences (lightning) will be used for limited suppression.

Wildland Fire Suppression and Rehabilitation:

Cultural Resources: Appropriate management response to wildland fire in the Cow Creek ACEC area would include conditional fire line tactics including the use of natural barriers and hand constructed fire line.

Prescribed Fire and Other Fuels Management: Prescription burns may be used to protect infrastructure or wildlife habitat that would be permanently lost in the event of a catastrophic wild fire. Use prescribed fire to achieve desired plant communities and to reduce hazardous fuel loads. Prescribed fires would generally not be used in areas of limited BLM ownership unless coordinated with adjacent landowners to achieve mutually beneficial objectives. Minimize impacts to sagebrush from prescribed fire wherever possible. Land uses will be monitored and adjusted as necessary after fire to sustain stable soils and vegetation. Some prescribed fire management objectives may be carried out by the limited fire suppression plan developed as part of the Upper Missouri watershed plan or National Monument Plan. When completing specific fire plans and designs in the Cow Creek ACEC, consult with appropriate Native American tribes on the potential to affect traditional cultural or religious concerns.

Vegetation: Prescribed burning may be used to enhance the growth and vigor of certain species and to maintain specific vegetation communities. To maintain viable sagebrush communities for winter range of elk, deer, antelope, and sage grouse, a mosaic of mature old growth sagebrush should be maintained.

LITTLE ROCKY MOUNTAINS, TIMBER (B2)

Area Description: The Little Rocky Mountains consist of blocks of public land surrounded by private and/or Fort Belknap Reservation land. These areas are mountainous with steep slopes and heavy timber. Commercial timber is abundant with some Douglas fir on the north slopes, ponderosa pine and lodge pole on the south slopes, and lodgepole pine at the highest elevations. Riparian vegetation occurs along the numerous small streams and drainages. There are interspersed grassy meadows within the timber types. Secondary roads intersect the area. The area offers big game summer and winter ranges and habitat for upland game species. Recreational uses include hunting, fishing, wildlife viewing and hiking. The area is also characterized by numerous roads from past mining activities.

Wildland Fire History: From 1980 to 1999 Federal agencies have responded to 108 fires on federal lands which burned an estimated 15200 acres. Average fire size was 141 acres.

Interface: Several ranches are built adjacent to public lands containing timber and steep slopes. Two small communities, Landusky and Zortman, have been identified as at risk because of proximity to heavy forest fuels and narrow one-way access.

Area Concerns and Constraints: Concerns and constraints include scattered land pattern, proximity of public and private lands, lands with cultural, paleontological, and vegetative values that might be damaged by high intensity wildland fire and fire suppression activities. Sensitive areas for cultural resources include the Dry Range west of the Smith River in Meagher County.

Resource Objectives: Manage native vegetation to meet standards for rangeland health. Maintain stable soils and sustain current land uses. Sagebrush habitats, especially those in identified sage grouse nesting and wintering areas and big game concentration areas should be maintained to the maximum extent possible. Scattered stands of Ponderosa Pine, especially those exhibiting old growth characteristics, shall be maintained where possible.

Fire Management Objectives: Fire, in most cases, can be desirable throughout this zone. However, each occurrence will have special consideration. Obvious concerns focus around structural developments, crop land, livestock and livestock forage needs. Social and political considerations will dictate how each fire occurrence will be managed.

Wildland Fire Suppression and Rehabilitation: Minimize the use of heavy equipment and avoid use of bulldozers in or near stream beds.

Prescribed Fire and Other Fuels Management: Prescribed fires would generally be used in this area to reduce the build up of natural and activity fuels, reduce the threat of stand replacement fire and reduce fire hazard in interface, rural inter-mix and residential areas. All prescribed fire activity would be coordinated with adjacent landowners to achieve mutually beneficial objectives. In some areas prescribed fire would be beneficial to achieve desired plant communities and to enhance wildlife use. Land uses will be monitored and adjusted as necessary after fire to sustain stable soils and vegetation. Mechanical treatment of hazardous and activity fuels would be used in some areas as a first entry. This would include use of wood products and hand piling and burning to reduce the threat of escaped prescribed fire. The second entry with prescribed fire would be broadcast/under burn. When completing specific fire plans and designs in specific areas sensitive for Native American traditional cultural and religious concerns, consult with appropriate Native American tribes on the potential to affect traditional cultural or religious concerns.

Forestry: The areas of primarily forested ground make up the vast majority of the Commercial Timber Base within the Malta Field Office. The majority of the timber is Ponderosa Pine, Douglas fir and Lodgepole pine as well as scattered pockets of hardwood species. Most areas show signs of decadence and mortality due to overstocking and the absence of fire and/or Forest Management, there is also wide spread insect damage in the mountain range. New stands of Ponderosa Pine and Douglas fir are encroaching into areas which historically were natural openings and meadows. Resulting fuel loads far exceed the normal range of variability. As forest management opportunities present themselves silvicultural practices may be applied which emphasize overall health of the forested stand and reducing fuel loadings in order to prevent loss due to fire, insects and disease.

Vegetation: Prescribed burning may be used to enhance the growth and vigor of certain species and to maintain specific vegetation communities. Maintain and promote stands of mature conifers with mixed grass and shrub under story vegetation. Protect riparian areas that exhibit an over story of deciduous trees from extreme fire events as conditions allow. To maintain viable sagebrush communities for winter range of deer, antelope, and sage grouse, a mosaic of mature old growth sagebrush will be maintained.

Wildlife: Inventory for bird nests and traditional mammal birthing areas will be conducted on each proposed prescribed burn areas in forested habitat one spring prior to the proposed project date. If permanent nest or birthing areas are located appropriate action including buffer areas will be identified in the burn plan to protect the site.

APPENDIX G

MILES CITY FIELD OFFICE FIRE MANAGEMENT PLAN

Background: The Miles City Field Office is responsible for fire management on lands located in Southeast Montana and Northwest South Dakota. The Miles City Field Office manages approximately 2,800,000 surface acres of public lands in eastern Montana and South Dakota.

Grasslands and shrublands are the most common land cover categories. Approximately 1,360,500 or (50 percent) acres of the public lands are considered grasslands. Mixed grass prairie and sagebrush-grassland communities are the most common land cover type on public land within the Field Office boundaries. Almost 783,200 acres (29 percent) of the public lands are considered shrubland. Wyoming big sagebrush steppe and big sagebrush steppe are the most common shrub vegetation land cover. Approximately 146,500 acres (about 5 percent) of public lands are considered forest lands and less than 58,000 acres (about 2 percent) of public lands are riparian areas. About 14 percent of the public lands are made up of other categories such as exposed rocks and badlands. Historical average annual fire occupancy and total acreage burned per year for the planning period 1988-1998 is 100 fires, burning 21,243 acres. Average fire size in the grass zone was 411 acres and the largest fire burned approximately 6000 acres of grass and shrub lands. In the timber zone average fire size was approximately 80 acres and the largest fire burned approximately 14,000 acres. Most of the wildland fires occurred in July and August.

The Miles City Field Office contains 18 ACECs and seven WSAs (Billy Creek, Seven Blackfoot, Bridge Coulee, Musselshell Breaks, Terry Badlands, Zook Creek, and Buffalo Creek). (See Map 8.)

Planning Guidance: The Powder River Resource Management Plan (March 1985) and the Big Dry Resource Management Plan (April 1996) and subsequent amendments will be updated as necessary to incorporate the fire management objectives and guidance for each fire management zone described below.

Amend the Powder River RMP ROD, Big Dry RMP ROD (Fire Management, page 7), and the South Dakota RMP ROD to include a five year fuels management plan. The plan will address hazardous fuel reduction and landscape restoration to improve ecological functions within the Miles City and South Dakota Field Office fire management areas in accordance with the Federal Wildland Fire Management Policy and Program Review (1995).

Amend the Areas of Critical Environmental Concern ROD, (Billings, Powder River and South Dakota, pages 3&4), decision that says "Fire will be managed with conditional fire suppression". This will be amended to include restrictions on the use of earth moving equipment to existing designated roads and trails.

Amend the Powder River RMP ROD (Range Management, page 3) decision that says "Prescribed burning may be used on about 20 acres annually." This will be amended to lift the acreage limitation and allow prescribed burning where it is deemed appropriate by the Field Office Manager.

Amend the Big Dry RMP ROD (Fire Management, pages 7 and 8) decision to use intensive fire suppression or conditional fire suppression during initial attack on wildland fires. This will be amended to use what is determined to be appropriate management response to wildland fires.

Amend the Big Dry RMP ROD (Forestry, page 8) decision that says "Sales of saw timber will not be allowed except salvage harvest of Ponderosa pine affected by insects, fire, or natural causes" to allow a prescribed vegetative and mechanical treatments, e.g. pre-commercial and commercial thinning in support of resource and fire management objectives. Best management practices using appropriate technology would be analyzed to provide for forest health standards and restoration of ecological functions.

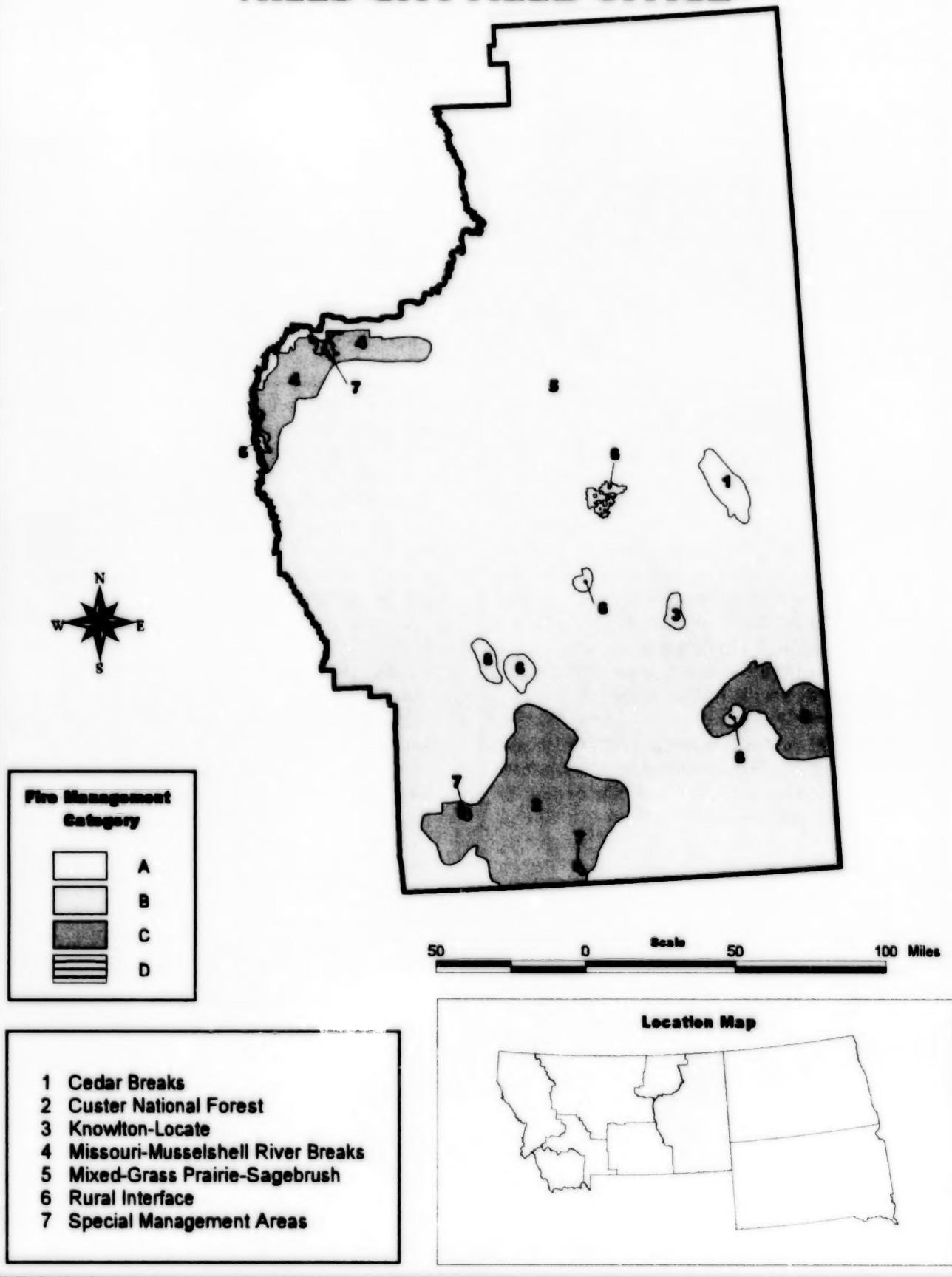
Fire Management Zones: The MCFO is divided into seven separate fire management zones. These distinctions are based on factors including fire management considerations, fire history, vegetation types, private property and infrastructure and other resource attributes.

The seven fire management zones include:

1. Cedar Breaks
2. Custer National Forest (Ashland and Sioux Districts)
3. Knowlton-Locate
4. Missouri-Musselshell River Breaks
5. Mixed-grass prairie - sagebrush
6. Rural Interface
7. Special Management Areas

Each area is unique in that it will have its own wildfire and prescribed fire objectives and priority.

MAP 8 MILES CITY FIELD OFFICE



The following discussions are resource issues and concerns that are common to each management zone and specifically address wildfire and prescribed fire scenarios.

Wildland Fire Suppression and Rehabilitation Guidance Common to all Areas Within the Miles City Field Office Boundaries: In addition to the state guidelines found in Appendix A, the following resources or values will be given further consideration as specified.

Forestry: Salvage harvest of Ponderosa pine may be allowed on trees affected by fire depending on the vegetation affected and the resource objective.

OHV use: Fire vehicles will avoid repeated travel over the same route to discourage the establishment of new trails and roads.

Prescribed Fire and Other Fuels Management Guidance Common to all Areas Within the Miles City Field Office Boundaries: In addition to the state guidelines found in Appendix A, the following resources or values will be given further consideration as specified. Use prescribed fire to reduce hazardous fuel loads, achieve desired plant communities, restore ecological function, and to manage wildfire. Minimize impacts to sagebrush stands and old growth conifers from prescribed fire wherever possible except when specifically addressed in individual fire plans. All fuels management projects will be monitored (short and long term) to determine if project objectives have been met and for future reference and to identify noxious weed invasion. Land uses will be monitored and adjusted as necessary after fire to sustain stable soils and vegetation.

Hazardous fuels reduction plans: Some areas of high risk include the Pine Hills Ranchettes east of Miles City, Moon Creek subdivision west of Miles City, the community of Ingomar in Rosebud County, Camp Needmore, Ekalaka Hills, West Pines southeast of Ekalaka, the Chalk Buttes southwest of Ekalaka in Carter County and the small urban interface area located along the Musselshell river in the Missouri breaks country of Garfield county. These are examples of areas at risk if there are wildland fires on public lands nearby. Coordinate hazardous fuels reduction plans with forestry to include forest health projects in planning, implementation, and funding.

Minerals: Care will be exercised to insure fire is excluded from coal bearing strata that is exposed to the surface. Fire treatment in areas that are developed for minerals, oil, and gas will be coordinated with the developing companies.

Vegetation: Prescribed burning may be used to enhance the growth and vigor of certain species and to maintain specific vegetation communities that are fire adapted. To maintain viable sagebrush communities for winter range of elk, deer, antelope, and sage grouse, a mosaic of mature old growth sagebrush will be maintained.

Weeds: Post-fire monitoring will include weeds monitoring to identify any weed invasion into a prescribed fire project area.

Wildlife: In those areas where sagebrush is treated and the objectives are met, the treatment will be done no more frequently than once in 30 years, unless necessary to reduce undesirable species encroachment. Prescribed burning may be used in sagebrush/grasslands outside of those identified to meet the mature/old growth structure and/or sage grouse habitat. The use of prescribed fire in identified sage grouse habitat will be coordinated with private landowners, and other agencies including: US Fish and Wildlife Service, and MT Fish, Wildlife and Parks.

RURAL INTERFACE AREAS (B6)

- Pine Hills Ranchettes (10 miles east of Miles City)
- Moon Creek Subdivision (25 miles southwest of Miles City)
- Musselshell Breaks Subdivision (50 miles west of Jordan)
- West Pines (10 miles east of Ekalaka)

Area description: These areas are characterized by intermingled blocks of public, state and private land. Vegetation is dominated by Ponderosa pine and mixed grass prairie. A majority of the timber stands have three distinct age classes: a mature overstory; a younger, dense or "dog hair" pole size class; and pockets of three inches diameter regeneration. Ponderosa pine habitat type with open uneven-aged stand structure and a moderate to dense understory of grass and shrubs is very uncommon. Grass species include little bluestem, sideoats grama, blue grama, western wheatgrass, green needlegrass and bluebunch wheatgrass. Shrub species include silver sagebrush, western snowberry and skunkbush sumac. The occasional ephemeral creeks and coulees have cottonwood, green ash and chokecherry. Native forbs vary depending on soil moisture and precipitation (15-19 inch PZ). Topography is rolling to steep and broken. Soils are primarily silty and sandy. Primary land uses are livestock grazing, recreation and wildlife habitat values.

Pine Hills Ranchettes (10 miles east of Miles City) is a rural setting with scattered areas of high density homes,

dwelling, and buildings. The area has medium escaped fire potential (i.e., moderate slopes, moderate fuels and some ladder fuels, moderate fire fighting response time, and a history of some large fires and moderate fire occurrence). The Pine Hills community is considered to have medium potential for loss of life or property (i.e. some characteristics may include narrow, dead end roads, steep grades, one way access, no or minimal fire fighting capacity, no water sources or fire hydrants, no pressure water systems, and fire conducive landscape. The community is considered to have low support for fuel reduction action and/or has expressed concerns or reservations concerning smoke issues. The area is considered to have medium support for developing a fire safe environment.

Moon Creek Subdivision (25 miles southwest of Miles City)

Musselshell Breaks Subdivision (50 miles west of Jordan), West Pines (10 miles east of Ekalaka) is considered to have low population density, low escaped fire potential, medium potential for loss of life or property, high community support, and medium community safe efforts. There is difficult access through Trenk Pass with a Type four heavy engine. Access is available from Powderville through private land.

Wildland Fire History: Fires are primarily lightning caused. Fuel loading is moderate to very high. Grass is the primary carrier and fires in this area have a high resistance to control due to topography and heavy fuels. These areas are all in a vegetation class and fuel type that historically had a fire return interval of 0-35 years.

Resource Objectives: Manage native vegetation to meet standards for rangeland health. Maintain stable soils and sustain current land uses. Restore historical forest stand conditions and the range of natural viability to withstand natural and unnatural disturbances. Trees exhibiting old growth characteristics will be maintained where possible. Riparian areas will be managed to meet standards for rangeland health with special emphasis to promote deciduous trees and shrubs.

Fire Management Objectives: Wildland fire is not desired due to rural interface. Following firefighter safety, social and political considerations for private land and ranch infrastructure will be priorities. Wildfire is usually undesirable, however, in some cases resource objectives may be met with limited suppression techniques.

Wildland Fire Suppression and Rehabilitation: Appropriate management response to wildland fire within these rural interface areas will generally be aggressive fire suppression.

Prescribed Fire and Other Fuels Management: Prescribed fires may be used to reduce hazardous fuel loads, to achieve desired plant communities and to manage wildfire patterns. Mechanical treatments such as thinning and commercial timber sales may be used in conjunction with a prescribed fire to achieve vegetation objectives in support of historical conditions.

This management zone is the highest priority area within MCFO for using fuel treatments to accomplish desired vegetation objectives. Land uses will be monitored and adjusted as necessary after treatment to sustain stable soils and vegetation.

SPECIAL MANAGEMENT AREAS (C7)

Area Description: Special Management Areas (i.e., recreation areas), Areas of Critical Environmental Concern (ACEC) and Wilderness Study Areas (WSAs) are included in this polygon. These areas receive special attention because of high resource values such as cultural, relic, vegetation, high visual and scenic values and/or historic attributes. A Resource Advisor shall assist the Incident Commander in making suppression decisions. Intensive fire suppression techniques, especially the use of heavy equipment, shall be carefully analyzed prior to being committed.

Special Management Areas:

Ash Creek Divide ACEC: A 7,931 acre area located in Garfield county designated for paleontological values.

Battle Butte ACEC: A 120 acre tract of public land in Rosebud County. This area is noted for high scenic values and possibly relic vegetation attributes.

Big Sheep Mountain ACEC: A 360 acre cultural site considered eligible for the National Register of Historic Places.

Billy Creek WSA: Includes 3,450 acres of public land located in northern Garfield county, 30 miles northwest of Jordan.

Bridge Coulee WSA: A 5,900 acre wilderness study area located in Garfield county 15 miles north of Mosby.

Buffalo Creek WSA: A 5,650 acre tract of public lands located 35 miles southwest of Broadus in Powder River County. This area has very high scenic and wildlife habitat values.

Bug Creek ACEC: A 3,840 acre site located in McCone county. This area contains unique paleontological values

recording the periods prior to, during, and after the extinction of the dinosaurs.

Calypso Special Recreation Management area: A 69 acre tract of public land adjacent to and managed similarly to the Terry Badlands WSA in Prairie County.

Cycad Fossil ACEC: A 321 acre tract of public land administered by the South Dakota Field Office. This area consists of unique, important geological and Paleontological formations. Appropriate management response to wildland fire would limit the use of earth moving and tillage equipment for wildland fire suppression to existing roads and trails unless waived by the Field Office Manager or an authorized officer.

Finger Buttes ACEC: A 1,900 acre tract of public land located about 40 miles south of Ekalaka in Carter County. This area features high scenic values with tall, slim, smokestack-like sandstone monuments, towers and prominence.

Hell Creek ACEC: A 19,169 acre site located in Garfield County. This area is a significant source of information on the time when the dinosaurs became extinct.

Hoe Site ACEC: A 144 acre cultural site that has been determined eligible for the National Register of Historic Places. Appropriate management response to wildland fire would limit the use of earth moving and tillage equipment for wildland fire suppression to existing roads and trails unless waived by the Field Office Manager or an authorized officer.

Howrey Island ACEC: A 321 acre tract of public land located on the Yellowstone River about 6 miles west of Hysham in Treasure County. This is a high use recreation area exhibiting riverine riparian vegetation and wildlife habitat. There is an active bald eagle nest on the northeast corner of the island portion of this tract. Travel is limited to the designated BLM road between February 15 and June 1 and would be closed to the use of earth moving equipment between June 2 and February 14.

Jordan Bison Kill ACEC: A 160 acre cultural site that is considered eligible for the National Register of Historic Places.

Lewis and Clark Historic Trail Special Recreation Management Area: Fourteen thousand acres of public land along the Missouri and Yellowstone rivers that have special historic significance.

Musselshell River Breaks WSA : A 8,650 acre site five miles north of Mosby in Garfield County. The area contains three major drainages to the Musselshell River.

Powder River Depot Special Recreation Management Area and ACEC: A 1,386 acre historic site eligible for the National Register of Historic Places.

Reynolds Battlefield ACEC: A 336 acre tract of public land located about 20 miles southwest of Broadus, along the Powder River. This is a riverine riparian community with high historical/cultural significance.

Sand Arroyo ACEC: A 9,056 acres site in McCone County. The area contains a fossil record of the Cretaceous and Tertiary periods.

Seline Site ACEC: An 80 acre site in Dawson county with unique cultural values.

Seven Blackfoot WSA: A 23,190 acre site in Garfield county, 30 miles northwest of Jordan. The WSA contains about 20,250 acres of BLM land contiguous to two Charles M. Russell National Wildlife Refuge wilderness study areas.

Smoky Butte ACEC: A 250-foot high prominence on 680 acres of public land located about 8 miles west of Jordan in Garfield County. Smoky Butte contains a rare mineralogic assemblage and is an excellent example of the geologic process of igneous intrusion.

Terry Badlands WSA: There are 42,950 acres of public lands in this parcel located about 3 miles west of Terry in Prairie County. Deep badland-type habitat arranged in parallel drainages and emptying into the Yellowstone River form a very scenic wildland landscape. Other than the Calypso Trail, which bisects the WSA, there are few trails within the WSA.

Zook Creek WSA: Approximately 8,438 acres of public lands located about 26 miles southwest of Ashland in Rosebud County. A combination of wilderness qualities, scenic attributes, high value relic vegetation and wildlife habitat make the area unique.

Wildland fire history: These are largely perennial grassland and sagebrush fuel types. This fire history is unavailable because individuals suppress many fires which do not get reported. Fire load in these areas is moderate (15-20 fires per year). Large fires are a yearly occurrence. They are commonly dominated by flashy fuels and have a very high resistance to control.

Interface: Interface area fire guidance is less of an issue in these because of remoteness, local topography and distance from developments. However, areas near ranches and other private property will need special attention.

Area concerns and constraints: Special concerns and constraints include ACECs with cultural, paleontological, and vegetative values that might be affected by firefighting equipment, and the use of earth moving equipment in the Wilderness Study Areas.

Resource objectives: Manage native vegetation to meet standards for rangeland health. Maintain stable soils and sustain current land uses. Sagebrush habitats, especially those in identified sage grouse nesting and wintering areas and big game concentration areas should be maintained to the maximum extent possible. Scattered stands of Ponderosa pine, especially those exhibiting old growth characteristics, shall be maintained where possible.

Fire management objectives: Fire, in most cases, may be desirable. However, each occurrence will have special consideration. Obvious concerns focus around structural developments, croplands, livestock, livestock forage, and wildlife habitat needs. Social and political considerations will dictate how each fire occurrence will be managed.

Wildland Fire Suppression and Rehabilitation: Apply appropriate guidance found in Appendix A.

Prescribed fire and other fuels management: Use prescribed fire to achieve desired plant communities, restore ecological function, manage wildfires and reduce hazardous fuel loads. However, because of the importance of these areas for special values the role of prescribed fire will be limited and very specific to each individual area.

MISSOURI-MUSSELSHELL RIVER BREAKS (C4)

Area description: Blocked and scattered public lands intermingled with private lands. Larger blocks are adjacent to the Charles M. Russell National Wildlife Refuge along the south shore of Fort Peck Lake in Garfield County. Additional lands are east of the Musselshell River. Vegetation is dominated by Ponderosa pine and mixed grass prairie. Timber stands normally have three distinct age classes: a mature overstory consisting of trees in the 12- 24 inch DBH, a mid-canopy pole-sized cohort in the 4- 12 inch DBH, and a less than three inch diameter age class. Other stands have a mature timber overstory with an open mixed grass and shrub understory. Mixed grass species include: little bluestem, sideoats grama, blue grama, western wheatgrass, green needlegrass, and bluebunch wheatgrass. Shrub species include silver sagebrush, western snowberry, skunkbush sumac, and chokecherry. Occasional ephemeral creeks and coulees can have cottonwood present. Native forbs vary depending on soil moisture and precipitation (15-19 inches PZ). Topography

is rolling to steep and broken. Soils are primarily silty and sandy. Primary land uses are livestock grazing, recreation, and wildlife habitat values.

This management zone has a very high priority for using prescribed fire to achieve management objectives. The area is very large (approximately 500,000 acres) and is dominated by Ponderosa pine vegetation. Nearly all of the stands have missed several burn cycles and are well beyond the natural range of variation for stand structure and composition. Because this area has large blocks of contiguous public lands and little ranch-related infrastructure it lends itself well to large-scale landscape-level prescribed fire projects.

Wildland fire history: This area of Ponderosa pine savanna has grasslands fuel type. This area has a high fire occurrence due to frequent lightning storms. Grass is the primary fire carrier and fires have a high resistance to control because of limited access and steep topography. Large fires exceeding one thousand acres occur on an average of every 3 years based on residual fire fuels, drought conditions and storm events.

Interface: Widely dispersed farm and ranch buildings in the Garfield County portion of the Breaks are considered to have high risk potential for escaped fire. Cropland and ranch facilities are a secondary concern.

Area concerns and constraints: Concerns include Wilderness Study Areas policy and guidelines, private property intermingled with public land, and the interface with the Charles M. Russell National Wildlife Refuge, forage production and cropland on private lands, and areas of steep topography and fragile soils.

Resource objectives: Manage native vegetation to meet standards for rangeland health. Maintain stable soils, sustain current land uses, implement guidelines for sustainable uses where necessary. Promote/maintain mature timber stands with an open mixed-grass understory. Sagebrush stands within designated sage grouse wintering/nesting areas shall be maintained.

Fire management objectives: Social and political considerations for intermingled private property is paramount. Wilderness Study Areas and interface with the Charles M. Russell NWR influence direct suppression tactics. Fire is generally desirable under all but extreme fire behavior conditions consistent with resource objectives.

Prescribed fires and other fuels management: Use prescribed fire to achieve desired plant communities, reduce hazardous fuel loads. Mechanical treatments such as thinning and commercial timber sales may be used in conjunction with or as an alternative to prescribed fire to

achieve vegetation objectives. Land uses will be monitored and adjusted as necessary after fire to sustain stable soils and vegetation.

KNOWLTON-LOCATE (B3)

Area description: This area has intermingled blocks of public, state and private land in Eastern Custer County, south and east of the Yellowstone River. Vegetation is dominated by Ponderosa pine and mixed grass prairie. Most timber stands have three distinct age classes: an overstory of mature large diameter trees, a younger dense or "doghair" understory of pole size class trees and pockets of less than three inch in diameter regeneration. Understory vegetation also includes mixed grass and shrubs. Grass species include little bluestem, sideoats and blue grama, western wheatgrass, green needlegrass and bluebunch wheatgrass. Shrub species include silver sagebrush, western snowberry and skunkbush sumac. The occasional ephemeral creeks and coulees have cottonwood, green ash and chokecherry. Native forbs vary depending on soil moisture and precipitation (15-19PZ). Topography is rolling to steep and broken. Soils are primarily silty and sandy. Primary land uses include livestock grazing, recreation and wildlife habitat values.

Wildland fire history: This area of scattered Ponderosa pine and savannah-like grasslands is about 50 percent federal ownership and has a scattered to slightly blocked ownership pattern. Fuel loading is moderate to very high. Fires are primarily lightning caused. Large fires exceeding 1,000 acres occur on the average of every five years. Grass is the primary carrier and fires in this area have a high resistance to control due to topography and roadless areas. Nearly one half of this area has been exposed to very large and extreme behavior fires in the last decade.

Interface: Numerous farm and ranch operations are located throughout the area. Interface safety concerns are high.

Area concerns and constraints: Concerns and constraints include private property intermingled with public lands, high riparian values, potential spread of noxious weeds (leafy spurge is widespread in riparian areas and coulees), and areas of fragile soils.

Resource objectives: Resource objectives include: 1. maintaining native species where they currently exist while managing non-native weeds, 2. managing for diversified grasslands which provide livestock and wildlife forage, and nesting and rearing habitat; 3. Restore historical timber stand conditions of mature conifers with mixed grass understory vegetation, 4. Protect riparian areas that exhibit

an overstory of deciduous trees from extreme fire events as conditions allow. Other objectives include limiting or minimizing erosion; maintaining sagebrush cover with a mosaic of community and dispersion of plants; maintaining sagebrush cover in designated sage grouse wintering/nesting areas; protecting, maintaining, and enhancing crucial wildlife habitats, wetland and riparian habitats, existing or potential fisheries habitats, and habitats for threatened and endangered species.

Fire management objectives: Social and political considerations for the private land and ranch infrastructure will be a priority following firefighter safety in this area. Wildfire is generally undesirable; however, in some cases resource objectives can be met with limited suppression techniques. Under extreme fire behavior conditions wildfire is undesirable.

Prescribed fire and other fuels: Prescribed fires may be used to reduce hazardous fuel loads, achieve desired plant communities, and manage wildfire patterns. Mechanical treatments such as thinning and commercial timber sales may be used in conjunction with or as an alternative to prescribed fire to achieve vegetation objectives.

This management zone is a high priority area within MCFO to use fuel treatments to accomplish desired vegetation objectives. Land uses will be monitored and adjusted as necessary after treatment to sustain stable soils and vegetation.

CUSTER NATIONAL FOREST (ASHLAND AND SIOUX DISTRICTS) (C2)

Area description: This management zone consists of all public lands near and adjacent to Custer National Forest lands near Ashland and Ekalaka, MT. Specific public lands include those near Birney and Broadus, MT. The National Forest lands are managed by the Ashland and Sioux Ranger Districts. Vegetation is diverse but generally dominated by Ponderosa pine and juniper woodlands in very rough topography. Sagebrush-grasslands are also well represented. Also included in this management zone are those areas of conifer/woodlands associated with the Powder and Tongue River Breaks between Highway 212 and the Wyoming State Line.

Wildland fire history: Fire is frequent in this area and is primarily lightning caused. Multiple starts following dry lightning storms are common. Grass and short-stature shrubs are the primary carriers. Fire has a high resistance to control from July through September due to topography, moderate to very high fuel loadings and low live fuel moistures. These areas are all in a vegetation class and fuel

type that historically had a fire return interval of 0 - 35 years.

Interface: Widely dispersed farm and ranch buildings are located throughout this area. While some ranch infrastructure is located in areas that are somewhat fireproof, much of it is located adjacent to heavy fuels and will require special suppression attention.

Area concerns and constraints: Special Management Area policy and guidelines, private property intermingled with public land and interface areas with the Custer National Forest. Forage production and crops on private lands. Areas of steep topography and fragile soils.

Resource objectives: Maintain resource values to meet standards for rangeland health including vegetation, soils and wildlife habitat. Promote/maintain mature timber stands with an open mixed-grass and shrub understory. Sagebrush stands within designated sage grouse wintering/nesting areas shall be maintained.

Fire management objectives: Social and political considerations for intermingled private property is paramount. Fire is generally desirable under all but extreme fire behavior conditions consistent with resource objectives.

Wildland fire suppression and rehabilitation: Unplanned ignitions will be contained using conditional fire suppression tactics when appropriate.

Prescribed fire and other fuels management: The Custer National Forest (CNF) has a very aggressive prescribed fire program that is well supported through the planning to implementation stages. Therefore most of the prescribed fire projects in this management zone shall be coordinated with ongoing CNF efforts. Use prescribed fire to achieve desired plant communities. Plan for potential to manage wildfire for desired results. Reduce hazardous fuels loads. Land uses will be monitored and adjusted as necessary after fire to sustain stable soils and vegetation.

CEDAR BREAKS (B1)

Area description: This area is part of the Cedar Creek watershed located south of Glendive, MT. The Cedar breaks portion of the watershed contains approximately 11,200 acres of timber lands. This area is broken into stands of Ponderosa pine and Rocky mountain juniper. Ponderosa pine stand structure is characterized by an overstory of mature ponderosa with a young "doghair thick" conifer understory made up of a second cohort pole

size ponderosa and juniper trees and smaller less than three inch diameter ponderosa and juniper regeneration. Juniper stands in the area generally consist of dense cohort and regeneration stages age classes. The juniper is encroaching into the grasslands that surround the area. Understory vegetation includes mixed grass and shrubs. Grass species include little bluestem, sideoats and blue grama, western wheatgrass, green needlegrass and bluebunch wheatgrass. Shrub species include silver sagebrush and western snowberry.

Wildland fire history: Most of the fire history of this area is unavailable due to private and county forces that suppress many fires which do not get reported. Fire load in this area is light (1-5 fires per year). Most fires are carried by light dead down woody and grass fuels.

Interface: Widely dispersed farm and ranch buildings are located throughout this area. Ranch infrastructure is located in somewhat fireproof areas. The area contains numerous oil and natural gas production facilities which could be at risk in the event of a large, stand replacing crown fire.

Area concerns and constraints: Concerns and constraints include private property intermingled with public lands, oil producing facilities, high riparian values, potential spread of noxious weeds, and areas of fragile soils.

Resource objectives: Resource objectives include: 1. Restore and maintain native species where they currently exist while managing non-native weeds, 2. Managing for diversified grasslands which provide livestock and wildlife forage, and nesting and rearing habitat; 3. Maintain and promote park-like stands of mature conifers with mixed grass understory vegetation, 4. Return areas of juniper encroachment to open grasslands.

Fire management objectives: Following firefighter safety, social and political considerations for private land, ranch infrastructure and oil and natural gas producing facilities will be priorities in this area. Wildfire is generally undesirable; however, in some cases resource objectives can be met with limited suppression techniques. Under extreme fire behavior conditions wildfire is undesirable.

Prescribed fire and other fuels management: Prescribed fires may be used to reduce hazardous fuel loads, achieve desired plant communities, and manage wildfire patterns. Mechanical treatments such as thinning and commercial timber sales may be used in conjunction with prescribed fire to achieve resource management objectives. Land uses may be monitored and adjusted as necessary after treatment to sustain stable soils and vegetation.

MIXED GRASS PRAIRIE-SAGEBRUSH (B5)

Area description: This area comprises all parts of the Field Office managed lands not specifically mentioned elsewhere.

The non-public lands within this area are agricultural lands, with uses including livestock grazing, irrigated farming and small grain production. Wildlife community includes whitetail and mule deer, antelope, upland game birds, turkeys, elk, raptors, songbirds and numerous small mammals, amphibians, and reptiles.

The Miles City Field Offices manages approximately 3,000,000 surface acres of public lands in the grasslands. Mixed grass species include: little bluestem, sideoats grama, blue grama, western wheatgrass, green needlegrass, and bluebunch wheatgrass. Shrub species include silver sagebrush, big sagebrush, western snowberry, and skunkbush sumac. Occasional ephemeral creeks and coulees can have cottonwood, green ash, and chokecherry present. Native forbes vary depending on soil moisture and precipitation (10-14 inch PZ). Topography is gently rolling to steep and broken. Soils are primarily silty and sandy.

Wildland fire history: The average annual fire occupancy is a scattered distribution of 15 fires burning an average of 6,460 acres per year. Approximately 70 percent of all fires are lightning caused. Fires in this area have moderate to high rates of spread due to the flashy light fuel types. Fire starts during critical fire conditions coupled with frequent high winds can rapidly change small fires into large project fires.

Interface: Some farm and ranch operations, and scattered rural subdivisions near public lands are most at risk from wildland fire on public lands. Full suppression will be used to protect these properties

Area concerns and constraints: Concerns and constraints include private property intermingled with public lands, high riparian values, potential spread of noxious weeds, and areas of fragile soils. Also include ACECs with cultural, paleontological, and vegetative values that might be affected by firefighting equipment, and the use of earth moving equipment in the Wilderness Study Areas.

Resource objectives: Manage native vegetation to meet standards for rangeland health. Maintain stable soils, sustain current land uses, implement guidelines for sustainable uses where necessary. Sagebrush stands within designated sage grouse wintering/nesting areas shall be maintained.

Fire management objectives: Following firefighter safety, social and political considerations for private land and ranch infrastructure will be priorities in this area. Wildfire is generally undesirable, however, in some cases resource objectives can be met with limited suppression techniques. Under extreme fire behavior conditions wildfire is undesirable.

Prescribed fire and other fuels management: Use prescribed fire to achieve desired plant communities, to manage wildfire, and to reduce hazardous fuel loads. Minimize impacts to sagebrush from prescribed fire wherever possible. Land uses will be monitored and adjusted as necessary after fire to sustain stable soils and vegetation.

APPENDIX H

MISSOULA FIELD OFFICE FIRE MANAGEMENT PLAN

Background Historically, fire was the dominant disturbance agent within the coniferous tree cover types associated with the Garnet Mountain Range of Western Montana. The fire regimes within these forested types are complicated and diverse. Fire can benefit several conifer species by aiding in reproduction, maintaining stand density within a site's specific carrying capacity (which also functions to reduce inter-tree competition), by reducing insect and disease epidemics and by cycling nutrients on the site. A variety of shrub, grass and forb species, important components of wildlife habitat, also depend on fire to varying degrees. Conversely, fire can adversely effect the forest through high intensity fires which result in high mortality of conifers in forest communities and which can cause widespread severe erosion, mass wasting, and other detrimental environmental effects.

Approximately 112,000 acres (77 percent) of the lands managed by the resource area are classified within the coniferous tree cover types. Approximately 9500 acres (7 percent) of land within the resource area is classified as grassland or shrub/grassland. The remaining approximately 23,500 acres (16 percent) of the lands are scree, rock, etc. The vegetation descriptions for the overall area and for each Fire Management Zone (FMZ) will mainly address the conifer cover types. Rangelands can be characterized as montane grasslands dominated by bunch grass (bluebunch wheatgrass, Idaho fescue and rough fescue) or bunch grass/sagebrush cover types.

The Field Office has been divided into four FMZs based on geographic divisions, suitability for fire use, and fuel types. The area also contains three ACECs (Bear Creek Flats, Rattler Gulch Limestone Cliffs, and Squaw Rock) and three WSAs (Wales Creek, Hoodoo Mountain, and Quigg West). (See Map 9.)

Environmental Impacts Environmental assessment (EA) of site specific proposals such as a prescribed fire or mechanical treatment to reduce fuel loading on a specific location will be necessary before those site specific actions occur.

Planning Guidance Guidance comes from the Garnet RMP (May, 1986, page 39) and associated amendments (Feb. 2, 1994-EA MT074-01-07 and July 10, 1997-EA MT074-07-06) which establishes the primary fire protection objective as preventing, detecting, suppressing, and monitoring all fires on BLM lands. The Federal Wildland Fire Management Policy (May 1996, 2001)

provides additional guidance. Prescribed fire will be used in support of resource management objectives (See Garnet RMP, May 1986, page 39). Prescribed fire will conform with the provisions of state regulations and implementation plans as specified in 9210-Fire Planning section of the BLM manual and associated handbooks.

Wildland Fire Suppression and Rehabilitation Guidance Applying to Individual Management Areas

Due to the complexity of fire regimes present within the Missoula Field Office, fire management guidelines have been tied to Management Areas (MA) identified within the Garnet RMP. The Field Office currently manages over 140,000 surface acres, which have been broken down into 14 management areas. The guidance listed as common applies to all public lands in Missoula, Powell and Granite counties. Guidance specific to certain areas is located within the corresponding FMZ or identified as guidance related to certain management areas.

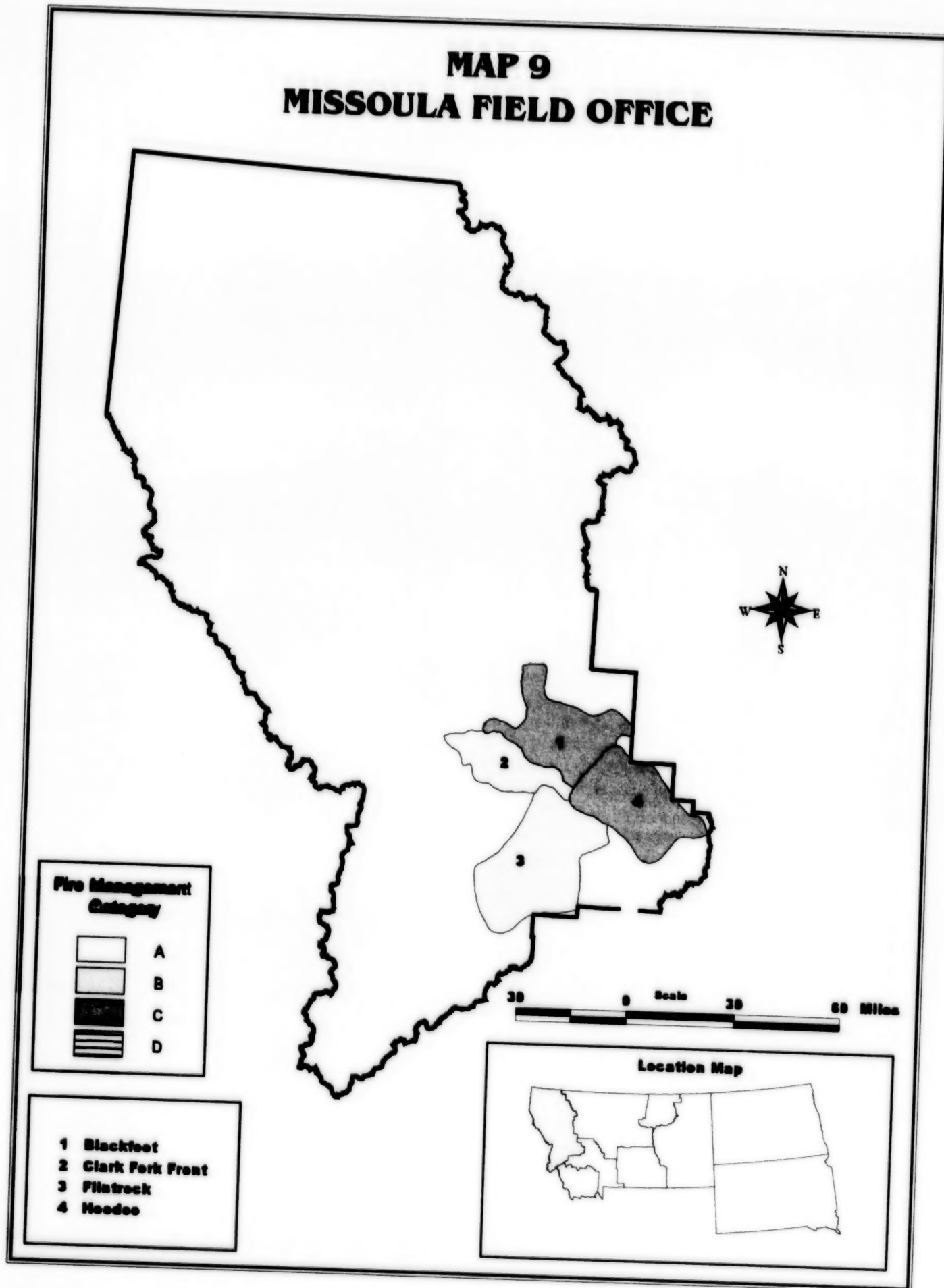
MA-1: Riparian Protection Zone (1,554 acres) and MA-2: Riparian Multiple Use Zone (3,475 acres)

- Avoid fireline construction within these areas.
- Avoid dropping retardant over open water (no tree canopy).
- Do not dam culvert inlets for water supplies - outlets may often have pools, or at least can be dammed with far less potential for impact. Do not excavate streams for watering pools. Use porta-tanks, pumps, and hose to bring water to an engine access spot rather than constructing access to streamside.

MA-3: General Forest Management (25,633 acres)

- Wildfires would be confined, contained, or controlled with salvage and rehabilitation strategy based on departure of resultant stand condition from range of natural variability assessed at multiple spacial and temporal scales.
- Using earth moving equipment in or adjacent to wallows, licks and wildlife security areas could adversely affect these specialized habitats. All the restrictions applied to earth moving heavy equipment use during timber harvest or other stand treatments should be applied to protect these specialized habitats during fire. There is no requirement to protect these features from burning during a wildfire event. Rehabilitation work in or near these features following suppression efforts should be guided by the management guidelines for ground and vegetation disturbance or product removal contained in the Management Area Guidelines (MA-3 guidelines referenced on pages 43-44 of

MAP 9 **MISSOULA FIELD OFFICE**



the Garnet RMP). The resource advisor will have discretion to modify those guidelines in the interest of crew safety or the urgent need to prevent a fire from escaping.

MA-4: Elk Summer and Fall Habitat Component (8,695 acres)

- During the suppression effort, operational constraints for earth moving heavy equipment similar to harvest or stand treatment actions would be applicable for equipment operating in or adjacent to wallows, licks and security areas. There is no requirement to protect the features from burning during the wildfire event. Rehabilitation work in or near the features following suppression efforts should be guided by the management guidelines for ground and vegetation disturbance or product removal contained in the Management Area Guidelines (MA-4 guidelines referenced on pages 44-46 of the Garnet RMP). The resource advisor will have discretion to modify those guidelines in the interest of suppression safety or escape fire potential.

MA-5: Big Game Summer and Fall Range (49,965 acres)

- During the suppression effort, operational constraints for earth moving heavy equipment similar to harvest or stand treatment actions would be applicable for equipment operating in or adjacent to wallows, licks and security areas. There is no requirement to protect the features from burning during the wildfire event. Rehabilitation work in or near the features following suppression efforts should be guided by the management guidelines for ground and vegetation disturbance or product removal contained in the Management Area Guidelines (MA-5 guidelines referenced on pages 46-47 of the Garnet RMP). The resource advisor will have discretion to modify those guidelines in the interest of suppression safety or escape fire potential.

MA-6: Big Game Winter Range (24,856 acres)

- Fire suppression objectives and tactics should retain as much canopy of large and very large trees as possible. The use of earth moving heavy equipment through open parks and on steep terrain should be minimized. Fire rehabilitation should concentrate on soil stabilization and native plant restoration. Attention to these details will enhance the resulting big game habitat condition for thermal cover and forage following a wildfire event.

MA-7: Noncommercial Forest and TPCC Withdrawn Commercial Forest (2,586 acres)

- Wildfires would be confined, contained, or controlled with salvage and rehabilitation strategy based on departure of resultant stand condition from range of natural variability assessed at multiple spatial and temporal scales.

MA-8: Areas Recommended for Wilderness Designation (520 acres)

Three Wilderness Study Areas (WSA) exist within the

Missoula Field Office; only one of which (Quigg West) has been recommended for designation as Wilderness. Until Fire Management Plans are developed for each WSA the following suppression guidelines provide interim guidance for all three areas.

- No earth moving heavy equipment will be used in these areas unless specifically authorized by the Field Manager. Mobile ground engines are not considered heavy equipment and may be taken off-road if living trees greater than 4 inches d.b.h. are not cut.

- MIST will be used to suppress fires in these areas (Appendix H1 for MIST guidelines).

MA-9: Special Management Areas (9,471 acres)

- No earth moving heavy equipment will be used in these areas unless specifically authorized by the Field Manager. Mobile ground engines are not considered heavy equipment and may be taken off-road if living trees greater than 4 inches d.b.h. are not cut.

- MIST will be used to suppress fires in these areas (see Appendix H1 for MIST).

MA-10: Developed and Undeveloped Recreation Sites (802 acres)

- No earth moving heavy equipment will be used in these areas unless specifically authorized by the Field Manager. Mobile ground engines are not considered heavy equipment and may be taken off-road if living trees greater than 4 inches d.b.h. are not cut.

- MIST will be used to suppress fires in these areas (see Appendix H1 for MIST).

- At developed recreation areas (campgrounds, day use sites, etc), no tree felling (over 4 inches d.b.h.) would be done after the first initial attack operational period without approval from a local BLM Resource Advisor.

MA-11: Historical and Cultural Sites (160 acres)

- Wildfire suppression methods are dependent on the type of site that is being threatened and will be selected to minimize or eliminate the impact on site values. The archaeologist will provide advice on fire tactics whenever a known site is threatened by fire. Fire will not destroy some MA-11s and in these cases fire will be allowed to pass over the sites and heavy equipment will not be used to protect them. Other areas are designated as "restrictive use areas" and the Missoula Field Office Archaeologist needs to be consulted prior to any heavy equipment use in those areas. Each MA-11 and their restrictions will be discussed in each of the four Fire Management Zone sections of this document.

MA-12: Visual Corridor (11,747 acres)

- Wildfire suppression methods that maintain visual quality will be selected whenever possible. (Visual Resource Management Guidelines are referenced on pages 21-22 and Appendix E, pages 91-93 of the Garnet RMP).

MA-13: Nonforest Habitat (352 acres)

- Wildfires would be confined, contained, or controlled with suppression methods that maintain visual quality whenever possible.

- Fire suppression objectives and tactics should retain as much canopy of large and very large trees as possible and minimize the use of mechanized equipment through open parks and on steep terrain. Suppression rehabilitation should concentrate on soil stabilization and native plant restoration. Attention to these details will enhance the resulting big game habitat condition for thermal cover and forage following a wildfire event.

MA-14: Mineral Production Area (820 acres)

- Firefighters and logistics personnel should take special precaution in areas of current and historic mining, as dangerous mine shafts/adits, explosives, and hazardous waste may be present.

GUIDANCE COMMON TO ALL PUBLIC LANDS WITHIN THE RESOURCE AREA

Fire Ecology The following table relates Fire Group (a group of habitat types similarly affected by fire) to fire frequency and fire severity within specific coniferous cover types occurring within Field Office boundaries. Percentage of the Field Office within the various cover types is also listed. The table illustrates the complex role fire historically played across landscapes in west central Montana. It also provides insight into how fire tends to function and its projected effects under present conditions. The historical role of fire should be kept in mind when prescribing and managing fire within the resource area.

Natural Fire Frequency and Severity for Coniferous Tree Cover Types

Fire Group	% of Area	Frequency	Severity**	Cover Type Description
4	10%	5-25 yrs	NL	Warm, dry Douglas fir habitat types. Commonly characterized as fire-maintained open ponderosa pine stands that develop Douglas fir regeneration beneath pine in absence of disturbance. Potential big-game winter range value is high (MA-6).
5	5%	35-45 yrs	NL-M	Cool, dry Douglas fir habitat types. Douglas fir often dominates all successional states. In absence of fire, dense Douglas fir understories may develop.
6	40%	15-45 yrs	M-L	Moist Douglas fir habitat types. Commonly characterized as fire-maintained relatively open western larch and ponderosa pine stands which support substantial amounts of Douglas fir even when subjected to periodic fire. Potential timber productivity and big-game winter range values are moderate to high (e.g., MAs-3&6).
7	30%	50-150 yrs	L-M	Cool habitat types usually dominated by lodgepole pine. Includes stands in which fire maintains lodgepole pine as dominant seral as well as a persistent dominant species. Potential big-game summer-fall range values are high (MAs 4&5)
9	15%	50-300 yrs	M-L	Moist, lower subalpine habitat types characterized by infrequent, severe fire regimes which created stands of emergent western larch over relatively dense mixed conifer understories. Potential timber productivity and big-game summer-fall range values are high (MAs 3,4&5)

* Fisher and Bradley, 1987, *Fire Ecology of Western Montana Forest Habitat Types*.

** NL-Non-lethal, L-Lethal, & M-Mixed Severity Fire Regimes.

Wildland Fire Suppression and Rehabilitation guidance common to all areas within Missoula Field Office boundaries In addition to the state guidelines found in Appendix A, the following resources or values will be given further consideration as specified.

Cultural: Cultural Sites Not Designated MA 11: Cultural resources in the Garnet Resource Area vary from prehistoric occupation sites to prehistoric lithic scatters to historic mining remnants to historic buildings and more. Most of the cultural resources in the Garnet Resource Area have not been designated as MA-11s, although some have determined to be eligible for the National Register of Historic Places (significant sites). Sites will continue to be evaluated for National Register of Historic Places eligibility and MA-11 designation.

When a wildland fire threatens BLM administered lands, the MiFO Archaeologist should be consulted as to the potential for cultural resources in the fire area. If significant cultural sites are in the wildland fire area, appropriate measures, as delineated below or as discussed with the MiFO Archaeologist, should be taken. See Appendix A also.

Appropriate management response to wildland fires that threaten significant cultural or paleontological resources depend on the type of resource being threatened and the location of the wildland fire. The MiFO Archaeologist should be consulted on the location of significant sites, on where a handline should be constructed in relation to a site and on appropriate mop-up activities. If a significant site is being threatened within the next 24 hour burning period, then minimum impact suppression tactics (MIST) should be used. The use of earth moving/tillage equipment would be prohibited for wildland fire suppression in all significant prehistoric, historic and paleontological site areas. If a significant historic site is being threatened because the site is projected to be in the fire's path, earth moving equipment can be used outside of the site area as long as the MiFO Archaeologist is consulted and concurs with the decision. In addition, building protection measures such as a water sprinkling system, foaming system or heat shield wrapping system, should be used whenever feasible to protect significant historic buildings.

Modified Suppression: Modified suppression may be used to reduce short or long-term adverse effects of fire suppression on public lands. Minimum Impact Suppression Tactics (MIST) are called for in specific MAs or for specific sites. The concept of MIST is to use the minimum amount of force necessary to effectively achieve the fire management protection objectives consistent with land and resource management objectives. It is a mind set on how to suppress a wildfire yet minimize the long-term

effects of the suppression action on the land. MIST may also require greater rehabilitation efforts than previously practiced. Specific fireline guidance on MIST, including considerations for each fire situation, logistics, aviation management, hazardous materials, fire rehabilitation, and demobilization practices can be found in the USDA Forest Service Northern Region Minimum Impact Suppression Tactics Guidelines- Fireline Handbook. If MISTs are not sufficient to reduce adverse effects, site specific fire use plans will be prepared to spell out how fire suppression will be modified under specific burning conditions and in specific locations.

OHV: OHV use off of established routes would be limited to those activities critical for suppression activities (as determined by the BLM Resource Advisor). Mobile ground engines are allowed off-road if living trees greater than 4 inches diameter at breast height (d.b.h.) are not cut. Decisions regarding the use of OHVs will utilize the Garnet RMP and associated amendments (Feb. 2, 1994-EA MT074-01-07 and July 10, 1997-EA MT074-07-06) as well as the Off-Highway Vehicle (OHV) EIS and Plan amendment for Montana, North Dakota and portions of South Dakota (incorporates the BLM's National OHV Strategy).

Salvaging Forest Products and Reforestation: Each site burned by wildfire will be evaluated to determine if salvage and reforestation are needed. The environmental effects of salvaging forest products and reforestation will be assessed under NEPA. Endangered Species Act consultation will be completed. If desired future conditions for upland vegetation have been established for a site, those desired future conditions will provide the purpose and need for BLM's actions (refer to Prescribed Fire and Other Fuels Management for explanation of desired future conditions and how it is established). An Environmental Assessment will be prepared for each salvage and reforestation proposal.

Seasonal Fire Restrictions and Closures: Emergency fire restrictions and closures for Southwest Montana are coordinated with other land management and fire protection agencies through the Southwest Montana Interagency Coordinating Group. An existing agreement spells out how public use restrictions and closures will be uniformly applied to all lands with similar fire danger ratings. The coordinating group meets as needed to agree to fire danger preparedness levels and each level calls for specific restrictions or closures to be imposed. Once a preparedness level is agreed to, the Missoula Field Manager will initiate action to place the appropriate restrictions or closures on public land.

Soil Protection: The effects of fire on soil are variable in relation to numerous factors. Burned Area Evaluation

Reports (BAER) will be completed for all public lands which have been severely burned and may be completed for moderately burned lands. The BAER will prescribe measures needed to stabilize soils and prevent erosion or mass wasting. Refer to Appendix H3 for specific guidelines relating to soil protection and fire suppression activities.

Prescribed Fire and other Fuels management guidance common to all areas within Missoula Field Office boundaries In addition to the state guidelines found in Appendix A, the following resources or values will be given further consideration as specified.

Over the past 40 years in this resource area, the BLM has used prescribed fire to reduce fuels by burning road and logging slash, prepare forest sites for natural or artificial reforestation and to improve wildlife habitat. These actions were most often driven by a single discipline. More recently a multi-disciplinary process has been used to establish desired future conditions for the public lands, including desired conditions for upland vegetation and riparian communities. The process currently being used to set desired future conditions is Ecosystem Analysis at the Watershed Scale (EAWS) also known as the Six Step Federal Process. The geographic area covered by the EAWS will vary from about 12,000 acres to about 35,000 acres and EAWS for the public lands in Powell, Missoula and Granite counties is scheduled to be completed by 2008.

As the Field Office completes EAWS, treatments are implemented through action plans to achieve desired future conditions. Desired future conditions for upland forested habitats often call for restoring stand conditions which were in sync with past fire regimes. Historic fire regimes in dry habitats at low elevations typically consisted of high frequency, low intensity, non-lethal fires while in cold, high elevation habitats, low frequency, high intensity lethal fires occurred. Between these two extremes is a variety of forest communities which co-existed with periodic fire disturbance and the varying effects of fire. BLM cannot permit historic fire regimes to return to its lands because of numerous adverse effects to the public's resources and the risk such a policy would present to private and other lands adjacent to BLM lands.

To achieve desired future conditions for public lands, a series of vegetative treatments will be prescribed. Thinning followed by prescribed burning to reduce fuel loads, cutting and removing fuels through commercial thinnings, removal of large trees valuable as sawlogs followed by prescribed burning to reduce fuels and prepared the site for reforestation and augmenting fuels through slashing to burn open savanna and parklands are examples of the types of treatments that have been applied and will continue to be

called for to arrive at desired future conditions. "Intermediate burns" not connected to prior thinning or harvest actions may be used to achieve wildlife habitat rejuvenation, fuels management, and lower disease risk.

Prescribed Fire and Other Fuel Treatment Guidance Applying to Individual Management Areas: The guidance listed under the following MAs is general guidance. Prescribed burn and/or fuel treatment plans will be developed on a site specific basis. Refer to Prescribed Fire and Other Fuels Management, above, for a description of how these plans are developed. If a MA is not listed below, all prescribed burn and fuel treatment guidance will be issued within the site specific plans.

MA-3: General Forest Management

- Following silvicultural treatments, prescribed fire would be used to reduce fuel loading and prepare site for regeneration.

- Periodic prescribed fire would favor broadly adapted seral species, enhance nutrient cycling and control stocking to maintain healthy stands and optimize timber growing potential. Periodic burning would also enhance wildlife habitat components through shrub restoration, snag recruitment, and augmentation of coarse down woody debris.

MA-7: Noncommercial Forest and TPCC Withdrawn Commercial Forest

- Following silvicultural treatments, prescribed fire would be used to reduce fuel loading and prepare site for regeneration.

- Periodic prescribed fire would favor broadly adapted seral species, enhance nutrient cycling and control stocking to maintain healthy stands and optimize timber growing potential. Periodic burning would also enhance wildlife habitat components through shrub restoration, snag recruitment, and augmentation of coarse down woody debris.

MA-8: Areas Recommended for Wilderness Designation

- Because the use of some fire suppression tactics and fuel management treatments is limited inside the WSAs, site-specific fire management plans will be prepared for the individual WSAs which consider the use of prescribed fire to reduce fuel loading and thus reduce the risk of high-intensity, wide-spread wildfire.

MA-11: Historical and Cultural Sites

- Fire will not be used as a management tool in these areas.

- Commercial forest land is set aside.

-Noncommercial forest land is unavailable for wood product harvest.

MA-13: Nonforest Habitat

-Periodic prescribed fire would favor broadly adapted seral species, enhance nutrient cycling and control tree encroachment to maintain healthy grass/shrub stands. Periodic burning would also enhance wildlife habitat components through shrub restoration, snag recruitment, and augmentation of coarse down woody debris.

BLACKFOOT (C1)

FMZ Description: Fire is desirable but its use is complicated or limited due to air quality, urban interface and other issues.

Area Description: The area exhibits a broad range of topography from sagebrush/grass flats to rolling uplands to steep, forested slopes. The area includes approximately 379,400 acres (20 percent BLM, 13 percent state, 63 percent private, 1 percent U.S. Fish and Wildlife Service, 3 percent FS). Highway 200 is the primary highway used to access the majority of this area. The majority of the BLM land within this FMZ is not within close proximity to Highway 200. The FMZ is characterized by numerous roads of various classes from past and present mining and logging activities. The majority of the land managed by the BLM within this area is contiguous ownership. The contiguous ownership is broken into three main "blocks" described as follows: Marcum Mountain area near Lincoln, Lower Blackfoot River Corridor and Elk Creek/Chamberlain/Garnet Ghost Town area. The area contains several ghost towns including Garnet Ghost Town, several Historic Mining Districts, a wide range of cultural resources, habitat for several threatened, endangered, or sensitive wildlife species such as bull trout, bald eagles, and lynx, Bear Creek Flats Area of Critical Environmental Concern (ACEC), the Wales Creek WSA.

This FMZ is dominated by coniferous tree cover types. The dominant conifer species present are ponderosa pine, western larch, Douglas fir, lodgepole pine, subalpine fir, Englemann spruce.

Wildland Fire History: Between 1978 and 1999, federal agencies have responded to 152 fires which burned an estimated 3,000 acres. Average fire size was 19.9 acres.

Interface: The Lower Blackfoot River Corridor is in close proximity to the town of Potomac and the numerous associated private homes occurring on adjacent land. Elk Creek drainage also contains private homes with small acreage surrounded by BLM and State forested land.

Interface with a group of private homeowners also exists at the 5 mile marker on the Garnet Range Road. The majority of the area managed by the BLM is contiguous lands so the remainder of the interface consists mostly of isolated homes and ranches occurring on adjoining land. Some private land and mining claims are intermixed within these large tracts of BLM ownership.

Area Concerns and Constraints: Garnet Ghost Town and some significant cultural resources may require fuel hazard reduction plans to be created and implementation of fuel hazard reduction adjacent to these structures. Fuel hazard reduction will aid in the protection of these structures during wildfire suppression efforts. The Blackfoot River Corridor has high recreational use, both on and off the river, during the fire season.

The Wales Creek WSA will limit the use of mechanical equipment and requires "light-on-the-land" techniques or MIST.

Bear Creek Flats ACEC is subject to constraints listed under Guidance Applying to Individual Management Areas for wildland fire suppression and rehabilitation, MA 9.

Elevation Mountain Repeater (T13N R13W Section 28), which assists in radio communication in the Blackfoot FMZ, needs protection.

Resource Objectives: Resource objectives for areas within this FMZ will be identified through the EAWS process (see Prescribed Fire and Other Fuels Treatment guidance common, above, for a discussion of EAWS). Through the EAWS process, landscape or watershed scale desired future conditions for upland vegetation are identified. EAWS have been completed for the Elk Creek Watershed (10,078 acres) and the lower Blackfoot River Corridor (11,770 acres). EAWS is in progress for Murray/Douglas/Yourname Creeks (22,000 acres) and is scheduled for completion in 2001; future EAWS will cover all the public lands by 2008. If desired future conditions for vegetation have not been written, the general guidelines or the guidelines given for each MA will apply to all fire suppression activities.

Fire Objective: The general fire objective is to reintroduce prescribed fire into the ecosystem to return to mid to late seral timber types in the Douglas fir/western larch communities. Fire, under specific conditions, is desired in the Wales Creek WSA to reduce decadent stands of lodgepole. A site specific fire management plan will be developed for the Wales Creek WSA to guide suppression of wildfires, WFMRO, and prescribed fire within the WSA. Conduct fuel hazard reduction projects around

sensitive sites such as Garnet Ghost Town and Coloma Ghost Town to reduce risk of catastrophic wildfire in these special areas.

Wildland Fire Suppression and Rehabilitation: The topics identified and discussed under the Management Areas below are specific to this FMZ. If a MA/topic is not listed below, refer to the general guidance listed under Wildland Fire Suppression and Rehabilitation Guidance common or Wildland Fire Suppression and Rehabilitation Guidance Applying to Individual Management Areas.

MA-3: General Forest Management

-Use MIST to protect the lodgepole pine progeny test site (located in T12N R13W Section 7 of the Elk Creek drainage) from wildfire.

MA-11: Historical and Cultural Sites

- Designated MA-11s in the Blackfoot Fire Management Zone include Garnet Ghost Town, Coloma Ghost Town, Reynolds City, Reynolds City Cemetery, Sand Park Cemetery, Warren Park, Copper Cliff, Skimmerhorn and Warren's Cabin.

- Full suppression tactics should be used around Garnet Ghost Town, Coloma Ghost Town, Copper Cliff, Warren's Cabin and Warren Park including building protection tactics. Existing roads will be used whenever possible. However, the use of earth moving heavy equipment within the site boundaries is prohibited.

- MIST will be used around the Reynolds City, Reynolds City Cemetery, Sand Park Cemetery, and the two sites within the Skimmerhorn area. The use of earth moving heavy equipment in these areas is prohibited.

- Most of the cultural resources in the Blackfoot Management Area have not been designated as MA-11s. Refer to section Wildland Fire Suppression and Rehabilitation Guidance common: Cultural Sites Not Designated MA11 for guidance.

CLARK FORK FRONT (B2)

FMZ Description: Fire is generally desirable and prescribed fire is needed to control pine, juniper, and Douglas fir encroachment onto the sagebrush-grass areas.

Area Description: The area is predominately steep forested slopes with scattered open grasslands. The area includes approximately 248,500 acres (9 percent BLM, 8 percent state, 83 percent private, 1 percent FS). US Interstate 90 is the primary highway used to access the majority of this area. The FMZ is characterized by

numerous roads of various classes from past and present mining and logging activities. The majority of the land managed by the BLM within this area is non-contiguous ownership. The area contains several Historic Mining Districts, a wide range of cultural resources, habitat for some threatened, endangered, or sensitive wildlife species such as bald eagles, and the Rattler Gulch ACEC.

This FMZ is dominated by coniferous tree cover types (approximately 80). The dominant conifer species present are ponderosa pine, western larch, and Douglas fir. The remainder of the area is generally open grassland (20 percent).

Wildland Fire History: Federal agencies have responded to 70 fires which burned an estimated 246 acres. Average fire size was 3.52 acres.

Interface: Isolated homes and ranches adjoin BLM land. The Bearmouth Chalet and campground is also in close proximity to BLM land. Private homes are scattered throughout the Ten Mile, Cramer Creek, and Bear Creek drainages.

Area Concerns and Constraints: Current mining claims and Historic Mining Districts are present within this FMZ. Rattler Gulch ACEC is within MA 9, Special Management Areas, and is subject to the constraints listed above under Guidance Applying to Individual Management Areas for wildland fire suppression and rehabilitation.

Resource Objectives: Resource objectives for areas within this FMZ will be identified through the EAWS process (see Prescribed Fire and Other Fuels Treatment guidance common, above, for a discussion of EAWS). Through the EAWS process, landscape or watershed scale desired future conditions for upland vegetation are identified. EAWS have currently not been completed for areas within this FMZ. Future EAWS will cover all the public lands by 2008. If desired future conditions for vegetation have not been written, the general guidelines or the guidelines given for each MA will apply to all fire suppression activities.

Fire Objective: Prescribed fire may be used to reduce Douglas fir and encourage the establishment of more fire tolerant ponderosa pine communities. Mechanical methods may be used to manage fuels around sensitive sites such as Rattler Gulch ACEC to reduce risk of catastrophic wildfire in these special areas.

Wildland Fire Suppression and Rehabilitation: Confine or contain unplanned ignitions to smallest feasible size unless a site specific fire management plan denotes other actions (i.e. WFMRO) are allowable.

The topics identified and discussed under the Management Areas below are specific to this FMZ. If a MA/topic is not listed below, refer to the general guidance listed under Wildland Fire Suppression and Rehabilitation Guidance common or Wildland Fire Suppression and Rehabilitation Guidance Applying to Individual Management Areas.

MA-9: Special Management Areas

According to the Rattler Gulch ACEC Management Plan mechanized ground disturbing activities will not be used in connection with fire suppression.

MA-11: Historical and Cultural Sites

- There are at least 7 sites that have been designated as MA-11s in the Clark Fork Front FMZ. These sites consist of Beartown, Bearmouth, Ravenna sub-station, portions of Deep Creek, an area around Sleepy Tom and some areas in Tenmile.

- MIST will be used around Beartown, Bearmouth, Ravenna sub-station, and the area in Sleepy Tom. The use of earth moving heavy equipment in these areas is prohibited.

- Fire will not destroy the sites within Deep Creek or the sites in Tenmile therefore fire may be allowed to burn over these areas. The use of earth moving heavy equipment in these areas is prohibited.

- Most of the cultural resources in the Clark Fork Front FMZ have not been designated as MA-11s. Refer to Wildland Fire Suppression and Rehabilitation Guidance common: Cultural Sites Not Designated MA11 for guidance.

FLINTROCK (B3)

FMZ Description: Fire is generally desired and prescribed fire is needed to control pine, juniper, and Douglas fir encroachment onto the sagebrush-grass areas.

Area Description: The area exhibits a broad range of topography from sagebrush/grass flats to rolling uplands to steep, forested slopes. The area includes approximately 664,000 acres (4 percent BLM, 2 percent state, 63 percent private, 31 percent FS). Montana State Route 1 is the primary highway used to access the majority of this area. The FMZ is characterized by numerous roads of various classes from past and present mining and logging activities. The majority of the land managed by the BLM within this area is non-contiguous ownership. The area contains several Historic Mining Districts, a wide range of cultural resources, habitat for some threatened, endangered, or sensitive wildlife species such as bald eagles, Squaw Rock ACEC and Quigg West WSA.

The area consists predominately of lodgepole pine and Douglas fir cover types. South facing slopes contain large sagebrush/grass parks. Approximately 20 percent of the area contains decadent stands of lodgepole pine, some of the Douglas fir stands are overstocked. Scattered stands of aspen are also present.

Wildland Fire History: Federal agencies have responded to 61 fires which burned an estimated 13,100 acres. Average fire size was 215.3 acres.

Interface: Isolated homes and ranches adjoin BLM land. Private homes are located in the lower Scotchman and Willow Creek drainages. The community of Phillipsburg and the surrounding subdivisions are located within close proximity to a block of BLM ownership. These interface areas will impact suppression efforts.

Other Area Concerns and Constraints: The Forest Service borders many BLM lands within this FMZ and future fire planning will require close coordination with that agency.

The Quigg West WSA limits the use of mechanical equipment and requires "light-on-the-land" techniques or MIST. Earth moving heavy equipment use will not be permitted unless specifically authorized by the Field Manager. Because the WSA designation constrains the use of some fire suppression tactics and fuel management treatments, a site-specific fire management plan will be prepared for the WSA. This plan will consider the use of both prescribed fire and Wildfire Managing for Resource Objectives (WFMRO) to reduce fuel loading and thus reduce the risk of high-intensity, wide-spread wildfire.

Squaw Rock ACEC is within Management Area 9, Special Management Areas, and is subject to the constraints listed under Wildland Fire Suppression and Rehabilitation Guidance Applying to Individual Management Areas for wildland fire suppression and rehabilitation.

Resource Objectives: Resource objectives for areas within this FMZ will be identified through the EAWS process (see Prescribed Fire and Other Fuels Treatment guidance common for a discussion of EAWS). Through the EAWS process, landscape or watershed scale desired future conditions for upland vegetation are identified. EAWS have currently not been completed for areas within this FMZ. Future EAWS will cover all the public lands by 2008. If desired future conditions for vegetation have not been written, the general guidelines or the guidelines given for each MA will apply to all fire suppression activities.

Fire Objective: Prescribed fire may be used to reduce Douglas fir encroachment into sagebrush parks, reduce overstocking of Douglas fir within the conifer stands by

removing a portion of the understory trees with fire and encourage aspen rejuvenation within old-aged stands. Fire, under specific conditions, may be desired within the Quigg West WSA. A site specific fire management plan will be developed for the Quigg West WSA to guide suppression of wildfire, WFMRO, and prescribed fire within the WSA. Quigg West WSA is adjacent to Forest Service land so any fire planning will require coordination with that agency. Manage fuels, as deemed necessary, with mechanical methods (i.e. chainsaws) around sensitive sites such as Squaw Rock ACEC to reduce risk of catastrophic wildfire in these special areas.

Wildland Fire Suppression and Rehabilitation: Confine or contain unplanned ignitions to smallest feasible size unless a site specific fire management plan (i.e. Quigg West WSA) denotes other actions (i.e. WFMRO) are allowable.

The topics discussed under the Management Areas below are specific to this FMZ. If a MA/topic is not listed below, refer to Wildland Fire Suppression and Rehabilitation Guidance common or Wildland Fire Suppression and Rehabilitation Guidance Applying to Individual Management Areas.

MA-11: Historical and Cultural Sites

- At least three sites have been designated as MA-11s in the FlintRock FMZ, including areas north of Philipsburg and an area near Rock Creek. The resource area Archaeologist will be consulted for further information.

- Fire will not destroy these sites and may be allowed to burn over them. The use of earth moving heavy equipment in these areas is prohibited.

- Most of the cultural resources in the Flintrock FMZ have not been designated as MA-11s. Refer to Wildland Fire Suppression and Rehabilitation Guidance common: Cultural Sites Not Designated MA11 for guidance.

HOODOO (C4)

FMZ Description: Fire is desirable but its use is complicated or limited due to concerns about air quality, urban interface and other issues.

Area Description: The area exhibits a broad range of topography from rolling sagebrush/grass parks to steep, forested slopes. The area includes approximately 432,900 acres (7 percent BLM, 7 percent state, 82 percent private, 4 percent FS). Montana State Route 141 is the primary highway used to access the majority of this area. The FMZ is characterized by numerous roads of various classes from

past and present mining and logging activities. The majority of the land managed by the BLM within this area is non-contiguous ownership. The area contains several Historic Mining Districts, a wide range of cultural resources, habitat for several threatened, endangered, or sensitive wildlife species such as bald eagles and lynx.

The area contains predominately lodgepole pine (70 percent) and Douglas fir (30 percent) forest types. Scattered stands of aspen are also present. Some sagebrush/grass areas occur at the lower elevations and high elevation southwest aspects.

Wildland Fire History: Federal agencies have responded to 50 fires which burned an estimated 520 acres. Average fire size was 10.4 acres.

Interface: The interface consists of isolated homes and ranches occurring on adjoining land. Private homeowners live in the Blackfoot City area. These interface areas will impact suppression efforts.

Area Concerns and Constraints: Current mining claims and Historic Mining Districts, such as the Blackfoot City area, are present within this FMZ.

The Hoodoo WSA will limit the use of mechanical equipment and require "light-on-the-land" techniques or MIST. Earth moving heavy equipment use will not be permitted unless specifically authorized by the Field Manager. Because the WSA designation constrains the use of some fire suppression tactics and fuel management treatments, a site-specific fire management plan will be prepared for the WSA. This plan will consider the use of both prescribed fire and Wildfire Managing for Resource Objectives (WFMRO) to reduce fuel loading and thus reduce the risk of high-intensity, wide-spread wildfire.

Resource Objectives: Resource objectives and Landscape or watershed scale desired future conditions for upland vegetation are identified. EAWS have currently not been completed for areas within this FMZ. Future EAWS will cover all the public lands by 2008. If desired future conditions for vegetation have not been written, the general guidelines or the guidelines given for each MA will apply to all fire suppression activities.

Fire Objective: Prescribed fire may be used to open up dense lodgepole pine stands, promote growth of ponderosa pine by reducing the current overstocking of Douglas fir on these sites, and to revitalize old-aged stands of aspen. Fire, under specific conditions, is desired in the Hoodoos WSA to reduce decadent stands of lodgepole. A site specific fire management plan will be developed for the Hoodoos WSA to guide suppression of wildfire, WFMRO, and prescribed fire within the WSA.

Wildland Fire Suppression and Rehabilitation: Confine or contain unplanned ignitions to smallest feasible size unless a site specific fire management plan (ie Hoodoos WSA) denotes other actions (i.e. WFMRO) are allowable.

The topics identified and discussed under the Management Areas below are specific to this FMZ. If a MA/topic is not listed below, refer to the general guidance listed under Wildland Fire Suppression and Rehabilitation Guidance common or Wildland Fire Suppression and Rehabilitation Guidance Applying to Individual Management Areas.

MA-11: Historical and Cultural Sites

- At least 3 sites that have been designated as MA-11s in the

Hoodoos FMZ. These sites consist of Blackfoot City, Blackfoot City Cemetery Annex and an area northeast of Avon, Montana.

- MIST will be used around the Blackfoot City Cemetery. Fire will not destroy Blackfoot City and the area northeast of the town of Avon. Therefore, fire may be allowed to burn over these areas. The use of earth moving heavy equipment within these areas is prohibited.

- Most of the cultural resources in the Hoodoo FMZ have not been designated as MA-11s. Refer to Cultural Sites Not Designated MA11 for guidance.

APPENDIX I

NORTH DAKOTA FIELD OFFICE FIRE MANAGEMENT PLAN

NORTH DAKOTA RESOURCE AREA (B1)

Area Description: This area encompasses 59,126 acres of BLM administered public land. About 56 percent of this land is located in Bowman County, 26 percent in Dunn County, with the balance found in mostly scattered parcels ranging from 2 to about 2,000 acres in size in 22 other counties. The land is used primarily for livestock grazing, oil and gas production, wildlife habitat, and recreation. (See Map 10.)

Wildland Fire History: There have been no wildland fires reported on BLM public lands in North Dakota for more than 20 years. However, if fire response is needed, it would be carried out by permittees, lessees, contractors, or local rural fire departments.

Interface: There is little if any interface between BLM public lands and structures in North Dakota. The primary interface of any type would be between the public lands and oil and gas well and facilities locations. Even at those locations, however, the companies have taken into account the possibility of fire and prepared the sites to prevent losses from prairie fires. Sites are cleared of vegetation and covered with gravel or scoria. Measures are taken to keep invasive weeds and grasses off the locations, thus eliminating fuel supplies. There also would be a small amount of interface between private cropland and BLM rangeland. A fire starting on BLM surface could burn onto cropland and cause a loss of that commodity in a few isolated locations.

Area Concerns and Constraints: Concerns are minimal because of the low occurrence of wildfires on the small acreage of BLM public lands. The main concern of a wildfire on BLM land would be its possible spread to adjacent private agricultural and range/pastureland. Wildfire could endanger members of the public on BLM's

2,000-acre Schnell Recreation Area. Also of concern would be the long-term loss of wildlife habitat, especially in woody draws.

Planning Guidance: Planning guidance is found in the North Dakota RMP, and the Final Activity Plan And EA for The Schnell Recreation Area. These will be updated to include the fire management objectives and guidance described below.

Resource Objectives: These are outlined in the North Dakota RMP Desk Document, July 1988, and the Final Activity Plan And EA For the Schnell Recreation Area, February 1996.

Fire Objective: Fire is not desired in North Dakota because of the large amount of private land and the relatively small isolated parcels of public land. Appropriate management response to most wildland fires in North Dakota would be aggressive fire suppression. The North Dakota RMP allows fire to play a natural role in the ecology of vegetation communities on public lands insofar as life, property, or private resources are not threatened. The Final Activity Plan And EA For The Schnell Recreation Area states: "Provide for prevention and control of wildfire on the property". Prescribed fire and other fuels management activities may be used to reduce fuels buildup and to avoid or mitigate the effects of potential wildland fire in rare cases.

Wildland Fire Suppression and Rehabilitation: Appropriate state guidelines found in Appendix A also apply to the North Dakota Field Office.

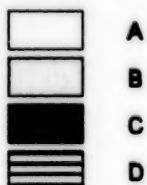
Prescribed Fires and Other Fuels Management: Appropriate state guidelines found in Appendix A also apply to the North Dakota Field Office.

MAP 10

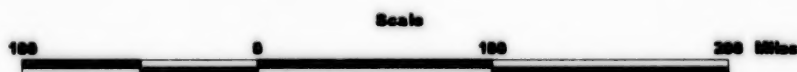
NORTH DAKOTA & SOUTH DAKOTA FIELD OFFICES



Fire Management Category



- 1 North Dakota
- 2 Exemption Area
- 3 Fort Meade Recreation Area
- 4 Remainder of South Dakota



Location Map



APPENDIX J

SOUTH DAKOTA FIELD OFFICE FIRE MANAGEMENT PLAN

Background: The South Dakota Field Office manages 279,670 surface acres of public land. Ninety percent of these public lands are in Butte (145,485 acres), Meade (42,045 acres), Harding (29,880 acres), Pennington (17,573 acres), and Stanley (16,435 acres) counties in the western part of the state. The primary economic use of public domain surface lands is for rangeland. Other significant uses include wildlife habitat, watershed protection, and recreation use.

Planning Guidance: Current guidance is provided by the South Dakota Resource Management Plan Record of Decision (April 1986) (item 8, page 10 of the April 1986 ROD), the Fossil Cycad Area of Critical Environmental Concern decision (page 4 of the ACEC Amendment, March 1999), and the Fort Meade Recreation Area ACEC Decision Record (September 26, 1996). The RMP will be updated to include the fire management objectives and guidance for each fire management zone described below.

Wildland Fire Suppression and Rehabilitation Guidance Common to all Areas Within the South Dakota Field Office Boundaries: In addition to the state guidelines found in Appendix A, the following resources or values will be given further consideration as specified.

Cultural: Appropriate management response to wildland fire in the Fossil Cycad and the Fort Meade ACEC areas would include fireline tactics that use natural barriers and hand constructed firelines.

OHV use: OHV use in the Fort Meade ACEC and the Fossil Cycad ACEC is limited to designated roads and trails. Fire vehicles will strive to limit repeated travel over the same route to discourage the establishment of new trails and roads.

Prescribed Fire and Other Fuels Management Guidance Common to all Areas Within the South Dakota Field Office Boundaries: State guidance found in Appendix A also applies to the South Dakota Field Office.

EXEMPTION AREA (B2)

Area description: The area includes 22,400 acres of public land that is intermingled with private land around Deadwood and Lead, South Dakota. Approximately 23 percent of this surface area is administered by the BLM and 77 percent is private surface. The Exemption Area is surrounded by Forest Service lands. A forest cover consisting mainly of ponderosa pine with some white

spruce covers most of the steep terrain. The grass cover consists of alpine timothy, pine grass, Canadian wild rye and assorted bromes. Forest lands cover approximately 90 percent of the public lands.

Wildland fire history: Between 1978 and 1999, federal agencies have responded to 25 fires which burned an estimated 11 acres. Average fire size was .4 acres.

Interface: Numerous residential and commercial developments are scattered throughout the private lands within the boundaries of this area. This includes a large number of mostly permanent dwellings, many of which are built within a few feet of public land. Hazardous fuels have built up in many areas. Seven priority interface areas have been identified.

Area concerns and constraints: The most significant concern and constraint is the amount and proximity of the existing urban interface. The risk of wildland fire in an urban interface area is a major concern in the Exemption Area. Most of the land in this area lies within 3 miles of either Deadwood or Lead. Dozens of permanent and vacation homes, businesses, municipal buildings, and commercial developments are in close proximity to BLM administered public lands and hazardous fuels. The combination of steep slopes and dense stands of pine cover create a hazardous fuel load for much of the area. Adjoining private lands will both drive and place constraints on fire management opportunities and will require close coordination and consultation with private landowners and the Forest Service.

Other concerns focus around structural developments, air quality and smoke dispersal, social and political considerations, and impacts of wildland fire and prescribed fires on local businesses, especially those related to recreation and tourism.

The area around Belle Eldridge Mine, southeast of Deadwood, is contaminated with heavy metals from mining activities. Ground crews and heavy equipment should use special care in this area until after heavy metals cleanup is complete. Heavy equipment should not be used on a suspected tailings repository located in S1/2NE1/4 of Sec. 26 T.5N., R.3E., BHM.

Resource objectives: Silvicultural practices will be used to maintain existing stands of ponderosa pine, reduce unwanted ponderosa encroachment, control insect and disease infestations, prevent hazardous fuel buildups, and

reduce safety hazards. Another resource objective is to maintain stable soils and sustain current land uses.

Fire objective: Wildland fire is not desired due to urban interface and scattered land pattern. The appropriate management response to wildland fire within the Exemption Area will be aggressive fire suppression. Vegetative management will be used to lower fuel levels, reduce risk levels, and reduce wildland fire severity. Hazardous fuels reduction is a primary fire management objective. Prescribed fire may be used in conjunction with mechanical and other treatments to meet this objective.

Wildland fire suppression and rehabilitation: Heavy equipment should be used with extreme caution to avoid mishaps from unmarked mining features throughout the Exemption Area. These features include unmarked mine shafts, adits, and vents that pose a safety hazard. Heavy equipment and ground crews should not be used for wildland fire suppression on sites contaminated with heavy metals from mining activities around the Belle Eldridge Mine southeast of Deadwood (W1/2NW1/4 of Sec. 25, and a portion of E1/2NE1/4 of Sec. 26, T.5N., R.3E., BHM).

Heavy equipment should not be used on a suspected tailings repository located in S1/2NE1/4 of Sec. 26 T.5N., R.3E., BHM.

Prescribed fire and other fuels management: Prescribed fire would only be used in this area in conjunction with other intensive fuels management treatments due to the proximity to Deadwood, Lead, and surrounding developments. Prescribed fire may be used to achieve desired plant communities and to reduce hazardous fuel loads. Land uses will be monitored to determine the extent objective are met and land uses are adjusted to sustain stable soils and vegetation. Follow-up treatments will probably be necessary every 5 to 10 years following initial treatment.

Air quality: Prescribed burning should not occur under conditions that result in a deterioration of air quality in Lead and Deadwood.

Hazardous fuels reduction plan: A Hazardous fuels reduction plan will be developed to reduce the risk of wildland fire near Lead and Deadwood, rural subdivisions, communications sites, power lines and pipeline rights-of-way, and other facilities and commercial uses.

FORT MEADE RECREATION AREA ACEC (B3)

Area description: This area contains 6,700 acres of public lands. Two major vegetative types occur in the area. Mid-grass prairie association is found on the north half and the unforested areas of the south half. The major plants in this association include bluestem, western wheatgrass, green needlegrass, and smooth brome. The other major vegetative type is a typical Black Hills timber association found on the forested portions of the south half. The major species include Ponderosa pine, bur oak, and smooth brome. Average annual precipitation ranges from 18 to 22 inches. This area is primarily used for recreation.

Wildland fire history: Between 1978 and 1999, federal agencies responded to 8 fires which burned an estimated 33 acres. Average fire size was 4.1 acres.

Interface: The west boundary of the area is adjacent to the east side of Sturgis, SD. Additional housing developments are located in adjacent areas. Historic Fort Meade, Fort Meade Medical Center, Black Hills National Cemetery, and housing developments are located in this area.

Area concerns and constraints: This area is a designated ACEC and contains historic and cultural sites. It is adjacent to the city of Sturgis, Fort Meade Medical Center, Black Hills National Cemetery, and housing developments. Special concerns and constraints include cultural, paleontological, and vegetative values that might be affected by fire fighting equipment, and the use of earth moving/tillage equipment.

Resource objectives: Resource objectives include maintaining and preserving the historic structures and associated resources contributing to the historic landscape within the ACEC; increasing vegetation diversity and effective edge (transitional zones where two plant communities or successional stages meet); retaining and enhancing key habitat components for game and nongame wildlife species; removing and controlling pine encroachment in meadow areas and deciduous draws using prescribed fire and/or selective fuel-wood cutting.

Fire objective: Wildland fire is not desired due to urban interface and ACEC values. The appropriate management response to wildland fire within the Fort Meade ACEC would be aggressive fire suppression in order to protect resource values, adjacent residential and city interface property. Hazardous fuel reduction efforts may be initiated to reduce the threat of wildland fire to adjacent private land and structures. Prescribed fire may be desirable. However, concerns focus around structural developments and

historical areas. Social and political considerations will dictate how each fire occurrence will be managed.

Wildland Fire Suppression and rehabilitation guidance: The Fort Meade ACEC is a VRM class II area, and fire rehabilitation should be coordinated with the Field Office VRM specialist.

Prescribed fire and other fuels management: Prescribed fire may be used to achieve desired plant communities, to manage wildfire, and to reduce hazardous fuel loads. All fuels management projects will be monitored (short and long term) to determine if project objectives have been met and for future reference. Land uses will be monitored and adjusted as necessary after fire to sustain stable soils and vegetation. Priority areas for hazardous fuels reduction would include Bluxburg, lands adjacent to Fort Meade Hospital, and lands adjacent to the city of Sturgis.

REMAINDER OF SOUTH DAKOTA FIELD OFFICE (B4)

Area description: This area encompasses close to 269,000 surface acres, mostly in scattered isolated tracts located throughout South Dakota. The primary land use for these tracts is for livestock grazing. Other values include wildlife habitat, watershed protection, and recreation opportunities. The vegetation is comprised of short- and mixed-grass prairie interspersed with sagebrush and western juniper in the Belle Fourche and Cheyenne river breaks. Precipitation varies from 13 to 17 inches in an average year.

Wildland fire history: Between 1978 and 1999, federal agencies responded to 8,321 fires which burned an estimated 399,500 acres. Average fire size was 48 acres.

Interface: Interface areas exist in Custer and Fall River counties.

Area concerns and constraints: The scattered land pattern is intermixed with state and private lands. Use of heavy equipment and other vehicles off designated roads

and trails is prohibited in the Fossil Cycad ACEC, northeast of Edgemont, SD, to protect geologic and paleontological values. Oil wells south of Edgemont contain hydrogen sulfide, which poses a safety concern for firefighters in the area. Obvious concerns include structural developments, croplands, livestock, and livestock forage needs. Social and political considerations will dictate how each fire occurrence will be managed.

Resource objectives: Manage native vegetation to meet standards for rangeland health. Maintain stable soils and sustain current land uses. Sagebrush habitats, especially those in identified sage grouse nesting and wintering areas and big game concentration areas should be maintained. Manage for healthy perennial vegetation and to reduce noxious weed infestations.

Fire management objectives: Fire, in most cases, is not desirable throughout this zone. Part of this objective is to reduce the threat of wildland fire to adjacent private land, primarily structures. The appropriate management response to wildland fire would generally be aggressive fire suppression. Prescribed fire could be used to reduce hazardous fuels or achieve other resource objectives. BLM could use prescribed fire in the remainder of the South Dakota Field Office area to reduce hazardous fuels or to meet other resource management objectives. The BLM could also be a cooperator on a prescribed fire initiated by another party.

Prescribed fires and other fuels management: Areas of fuels buildup most likely to be treated by prescribed fire would be heavy cover of junipers in the Cheyenne River breaks. All fuels management projects should be monitored (short and long-term) to determine if project objectives have been met and for future reference. Land uses should be monitored and adjusted as necessary after fire to sustain stable soils and vegetation.

Minerals: Fire treatment in areas that are developed for minerals or oil and gas will be coordinated with the developing companies to limit the danger from hydrogen sulfide gas exposure.

APPENDIX K

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